St. Mary's University
School of Graduate Studies

DETERMINANTS OF LIQUIDITY OF PRIVATE COMMERCIAL BANKS IN ETHIOPIA

BY
MITIKU CHERINET

ID.No: SGS/0052/2007A

MAY, 2017
SMU
ADDIS ABABA

DETERMINANTS OF LIQUIDITY OF PRIVATE COMMERCIAL BANKS IN ETHIOPIA

BY
MITIKU CHERINET

A THESIS SUBMITTED TO ST.MARY'S UNIVERSITY SCHOOL OF GRADUATE STUDIES IN PARTIALFULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF BUSINESS ADMINISTRATION (ACCOUNTING AND FINANCE CONCENTRATION)

MAY, 2017
SMU
ADDIS ABABA

St. Mary's University

School of Graduate Studies

DETERMINANTS OF LIQUIDITY OF PRIVATE COMMERCIAL BANKS IN ETHIOPIA

BY

MITIKU CHERINET

APPROVED BY BOARD OF EXAMINERS

_____	_____
Dean, Graduate Studies	**Signature& Date**
_____	_____
Advisor	**Signature & Date**
_____	_____
External Examiner	**Signature & Date**
_____	_____
Internal Examiner	**Signature & Date**

DECLARATION

I, the undersigned, declare that this thesis is my original work, prepared under the guidance of Master of Business Administration in Accounting and Finance. All sources of materials used for the thesis have been duly acknowledged. I further confirm that the thesis has not been submitted either in part or in full to any other higher learning institution for the purpose of earning any degree.

Mitiku Cherinet _____

Name Signature& Date

St. Mary's University, Addis Ababa **May, 2017**

ENDORSEMENT

This thesis has been submitted to St. Mary's University, School of Graduate Studies for examination with my approval as a university advisor.

Zenegnaw Abiy (PhD.) _____

Advisor Signature

St. Mary's University, Addis Ababa **May, 2017**

Table of Contents

Contents Page

Table of Contents

Contents Page

Acknowledgments

First and for most, I would like to thanks the almighty of GOD for all his assistance to accomplish my Project.

My sincere and deepest gratitude goes to my advisor and instructor, Zenenaw Abiy (PhD), for his constructive comments, valuable suggestions and good guidance. I equally thank him for his kindness and necessary encouragement. My thank also goes to the employees of the National Bank of Ethiopia for giving me the relevant financial data for the study. I also want to give special thanks to my friends, Solomon Checkol and Belay Getachew, for their valuable comments and guidance.

At last but not the least, my great thanks go to all my friends and workmates those who provided me all the necessary assistance when doing my thesis.

Acronyms

AIB: Awash International Bank S.C.

BCBS: Basel Committee for Banking Supervision

BIS: Bank for International Settlement

BLUE: Best Linear Unbiased Estimator

BOA: Bank of Abyssinia S.C

CAP: Capital adequacy

CBE: Commercial Bank of Ethiopia

CLRM: Classical Linear Regression

Model CPI: Consumer Price Index

DB: Dashen Bank S.C DW: Durbin-Watson

ESRB: European Systemic Risk Board

FEM: Fixed Effect Model

GDP: Gross Domestic Product

HP: Hypotheses

JB: Jarque-Bera

LCR: The Liquidity Coverage Ratio

LG: Loan growth Rate

LOLR: Lender of Last Resort

NBE: National Bank of Ethiopia

NIB: Nib International Bank S.C

OLS: Ordinary Least Square

REM: Random Effect Model

UB: United Bank S.C

WB: Wegagen Bank S.C

List of Tables and figures

A b s t r a c t

Liquidity is one of the major concerns for banks and thus achieving the optimum level of liquidity is crucial. The main objective of this study was to identify the determinants of liquidity of private commercial banks in Ethiopia. In order to achieve the research objectives, data was collected from a sample of six private commercial banks in Ethiopia over the period from 2000 to 2015. Bank specific determinants bank size, capital adequacy; deposit growth, market concentration, on-performing loan and National Bank bill were analyzed by using the balanced panel fixed effect regression model. Bank's liquidity is measured in liquid asset to total asset. The findings of the study revealed that, National Bank bill and non-performing loan has negative and statistically significant impact on liquidity; while market concentration have positive and statistically significant impact on liquidity of Ethiopian private commercial banks. However, bank size, capital adequacy and deposit growth have no statistically significant effect on the liquidly of Ethiopian private commercial banks. The result of the study shows that higher level of market concentration among private commercial banks and due to excessive lending, the possibility of defaulting loans were increased. The study recommends that private commercial banks should plan their loan portfolio to reduce risk and government should control the competition to have more competitive edge in the industry.

Keywords: Bank Size, Capital adequacy, Commercial bank, National Bank, liquidity, panel data regression analysis.

CHAPTER ONE
INTRODUCTION

1.1Background of the Study

Banks are financial institutions that play intermediary role in the economy through channeling financial resources from surplus economic units to deficit economic units. In turn, banks facilitate the saving and capital formation in the economy. Bank for International Settlements/BIS (2008) defines liquidity as the ability of bank to fund increases in assets and meet obligations as they come due, without incurring unacceptable losses. Hence, liquidity risk arises from the fundamental role of banks in the maturity transformation of short-term deposits into long-term loans. Therefore, banks have to hold optimal level of liquidity that can maximize their profit and enable them to meet their obligation.

Bank's liquidity indicates the ability to finance its transactions efficiently. If the bank is unable to do this it is known as the liquidity risk. As this risk increases the bank is considered unable to meet its obligations (such as deposits withdrawal, debt maturity and funds for loan portfolio and investment). Bank for International Settlements (BIS, 2008) explains liquidity as bank's ability to finance increases in assets and meets its obligations without losses. A bank should acquire proper liquidities when needed immediately at a sensible cost.Since, Commercial banks are profit seeking organizations, the way the commercial banks handle their portfolio is how the profits are reflected in their books. Portfolio management is basically how the commercial banks handle their assets and liabilities.

According to Aspachs (2005), Portfolio management refers to the management of assets and liabilities in such a way that the profits are maximized. Though banks want to make profits but at the same time they are concerned about liquidity and safety. In fact these three namely liquidity, profitability and safety are the main objectives of a monetary policy.

Banks have to earn profits because if they don't, they would not work as all the shareholders would sell off the shares if proper dividends are not earned. Hence they have to earn profits for their shareholders and at the same time satisfy the withdrawal needs of its customers.

According to I&G (2006) liquidity risk for a bank as the expression of the probability of losing the capacity of financing its transaction, or the probability that the bank cannot honor its daily obligation to its clients which includes the withdrawal of deposit, maturity of other debt, and cover additional funding requirements for the portfolio and investment. According to Crowe (2009), a bank having good assets

quality, strong earnings and sufficient capital may fail if it is not maintaining adequate liquidity. As a consequence, banks fundamental needed to hold not only an optimal level of capital but also liquidity to maintain efficient and operational excellence.

The financial sector in Ethiopia has been experiencing major transformation on its operating environment following the political change. On top of this, sixteen private commercial banks have been opened during the last twenty years. The competition in the banking industry of Ethiopia becomes increasing from time to time as more new private domestic banks are joining to the industry. Especially, it creates competition among banks in terms of resource mobilization which leads to curiosity in liquidity management. Even, the private commercial banks attentive the public banks to actively compete in the resource mobilization through expanding branch networks and implementation of new strategies.

The Central Bank regularly monitors banks' adherence to Basel I capital adequacy requirements, and virtually all commercial banks have risk adjusted capital adequacy ratios well above the minimum requirements of 8%. Basle II capital adequacy rules are enforced and supervision includes both on-site and off-site. 31 day on-site inspection process for both banking and insurance supervision and 5 day off-site analysis for banking and 15 day off-sit analysis for insurance is established and practiced (AfDB-Ethiopia Risk Assessment Report 2014).

The Government amended banking laws aimed to improve corporate governance of banks and to consolidate the stability and safety of the banking sector. These laws are being enforced. The NBE controls the bank minimum deposit rate, which now stands at 5%, while loan interest rates are allowed to float. The Government of Ethiopia (GOE) offers a limited number of 28-day, 3-month, and 6-month Treasury bills, but prohibits the interest rate from exceeding the bank deposit rate. The National Bank of Ethiopia (NBE) began to offer a one year Treasury bill in November 2011. The yields on these T-bills are below 2%. There is a need to deepen the financial services and instruments and to further liberalize the financial sector in Ethiopia. As the sector becomes more dynamic and diversified, the regulatory capacity of NBE will also demand further strengthening. Lack of access to finance is a hindrance for local businesses. Banking coverage stands at about 39,402 people per commercial bank branch for the year end 2013/14, concentrated mainly in urban areas, making Ethiopia one of the most under-banked countries in sub-Saharan Africa.

Liquidity in the Ethiopian banking industry (NBE-Annual report-2014), is basically explained by net change in liquidity positions between commercial banks (Total Net resources mobilized by the banking system in the form of deposit, loan collection and borrowing and Disbursement).Fundamentally speaking, many of the activities of commercial banks in Ethiopia depend on their ability to provide liquid funds to their clients.

The banks behavior in pooling and allocating funds determines the level of liquidity. Afterward, banking liquidity influence monetary policy. In addition, volatility in a bank's liquidity could induce systemic risk of the banking system. Therefore, it is necessary to understand the determinants of banking liquidity. By understanding the determinants of banking liquidity, as the monetary authorities, central bank determines proper monetary policy, particularly in prevailing or managing banking crisis. Due to the unexpected shock and grievous loss in financial markets, determining liquidity is vital for a better understanding of the concepts of liquidity risk in relation with other financial risk.

For aforementioned reason, any bank operating in Ethiopia shall statutorily require to comply with the reserve and liquidity requirement directive of the National Bank of Ethiopia (NBE) as a means of effectively managing the liquidity positions of banks. As a matter of fact, the first strategy to liquidity management in Ethiopia is compliance with these statutory reserve requirement and liquidity ratios as stipulated by the directives. To this regard, strategic measures has been employed by the NBE to improve banking system liquidity & stability and a steady flow of credit to the real sector of the economy includes the continuous reduction of the statutory reserve requirement and liquidity ratio. For instance, NBE has reduced statutory reserve requirement from 15% to 10% and then to 5% and liquidity ratio requirement from 25% to 20%and then to 15% under Directives No., SBB/46/2012 & SBB/55/2013 and Directives No. SBB/44/2008, SBB/45/2012 & SBB/57/2014, respectively.

The study was conducted by examining determinants of liquidity of private commercial banks in Ethiopia. However, factors affecting private commercial banks liquidity is still unexplored part. Therefore, empirical studies are essential to identify the determinants of liquidity of Ethiopian private commercial banks and hence this paper aims to study on the determinants of bank's liquidity in Ethiopian private commercial banks. Thus this paper was set to investigate the possible determinants of bank specific factor of liquidity that could have a causal effect on liquidity. In particular this paper was set to assess whether there exist a relationship between; Bank Size, Capital adequacy, Deposit

growth ,Market concentration ,Non-performing loan and National Bank of Ethiopia Bill. These factors were also chosen because they have been used widely in an attempt to predict the causes of liquidity risk problem in commercial banks. Therefore, the main purpose of this study was to empirically examine the determinants of private commercial banks liquidity in Ethiopia.

1.2 Statement of the problem

The financial system enables an economy to be more productive as it allows investors with few resources to use savings from those with few prospects of investing. Moreover, with regard to liquidity, the fundamental role of banks in the maturity transformation of short-term deposits into long-term loans makes banks inherently vulnerable to liquidity risk, both of an institution- specific nature and that which affects markets as a whole. Liquidity creation itself is seen as the primary source of economic welfare contribution by banks but also as their primary source of riskBryant (1980) or Calomiris and Kahn (1991). Therefore, virtually every financial transaction has implications for a bank's liquidity.

In recent years, the world economy has experienced a number of financial crises. Often, at the center of these crises are issues of liquidity provision by the banking sector and a financial market. For example, when crises are likely to arrive, banks seem less willing to lend and hold more liquidity due to the low level of liquidity in the market for external finance Acharyaet al (2011). Berger and Bouwman (2009b) found the connection between financial crises and bank liquidity creation: the subprime lending crisis was preceded by a dramatic build-up of positive abnormal liquidity creation, which implies that "too much" liquidity creation may also lead to financial fragility. Acharya and Naqvi (2010) are also successful in explaining how the seeds of a crisis may be sown when banks are flush with liquidity. Hence, bank liquidity management is important for both bank managers and policymakers in safeguarding overall financial stability.

Therefore, globally, the adequacy of liquidity plays very crucial roles in the successful functioning of all business firms. However, the issue of liquidity, though important to other businesses, is most paramount to banking institutions. Liquidity shortage, no matter how small, can cause great damage to a bank's operations Ifeoma et al, (2013). Liquidity crisis, if not properly managed, can instantly destroy those good customer relationships built over the years. Managing liquidity is therefore a core daily process requiring bank managers to monitor and project cash flows to ensure that adequate liquidity is maintained at all times. However, the liquidity fragility is also a source of efficiency. Diamond and

Rajan (2001) argue that the financial intermediation structure is efficient in that it disciplines banks when carrying out their lending function. The threat of a run is an incentive for the bank to choose projects with high return. More generally, this also suggests that an "even more liquid" bank might not always be desirable for the efficiency of the financial system. Therefore, effective liquidity risk management helps ensure a bank's ability to meet cash flow obligations, which are uncertain as they are affected by external events and other agents' behavior and to keep their optimal profitability.

As it deeply indicated in the literature part most studies on the title were done abroad Vodová(2012); Valla et al. (2006), with some of them in Africa Chagwiza(2011); Laurine(2013) and in Ethiopia counted the issues of this studies were made related to banks liquidity andwhat can draw in that, though there are a lot of researches conducted by different researchers, their result varies or lack of consistencies. For instance Tseganesh(2012);Mekbib(2016) and Berhanu (2015) found that bank size has a significant effect on liquidity but Belete(2015) found that it has insignificant result. When it comes to the variablecapital adequacy Tseganesh(2012) found that a significant result but Mekbib(2016) found that insignificant result. In additionTseganesh(2012) found that non-performing loan has statically significant result but Nigist(2015) insignificant result. These inconsistencies call for undertaking a study on the topic. Therefore, the purpose of this to fill the above stated gap by analyzing firm specific determinants of banks liquidity by providing full information about the relationship between liquidity and firm specific determinants.

1.3 Objective of the study

1.3.1 General Objective

The general objective of this study is to identify the determinants of bank's liquidity in Ethiopian private commercial banks.

1.3.2 Specific Objectives

The study has six specific objectives as outlined below: -

- To determine the effect of bank size on the liquidity of private commercial banks in Ethiopia.
- To determine the effect of capital adequacy on the liquidity of private commercial banks in Ethiopia.
- To determine the effect of non-performance loan on the liquidity of private commercial banks in Ethiopia.
- To determine the effect of deposit growth on the liquidity of private commercial banks in

Ethiopia.

- To determine the effect of market concentration on the liquidity of private commercial banks in Ethiopia.
- To determine the effect National Bank of Ethiopia's bill purchase on the liquidity of private commercial banks in Ethiopia.

1.4 Hypotheses of the study

In order to evaluate and identify the determinant, the following major hypotheses was tested in the case of Ethiopian private commercial banks. These hypotheses are predictions about the outcome of the results and they may be written as alternative hypotheses specifying the exact results to be expected (more or less, higher or lower of something). They also may be stated in the null form, indicating no expected difference or no relationship between groups on a dependent variable as stated by (Creswell 2009).

Therefore, this study developed the following six hypotheses:

H1: Capital adequacy has significant effect on bank's liquidity.

H2: Bank size has significant effect on bank's liquidity

H3: Deposit growth has significant effect onbank's liquidity.

H4: Non-performance loan hassignificant effect on bank's liquidity.

H5: Market concentration has significant effect on bank's liquidity.

H6: National Bank of Ethiopia's bill purchase has significant effect on bank's liquidity.

1.5 Scope of the study

The scope of the study is restricted to the determinants of the firm specific factors affecting bank liquidity of leading private commercial banks registered by the NBE in terms of their year of establishment and market share namely, AIB, DB,BOA, WB, UB and NIB and that have at least sixteen years data from 2000-2015. The study focus on the following variable Bank size ,Capital adequacy ratio ,Deposit growth rate ,Market concentration ,National Bank Bill and Non-performing loan.

1.6 Significant of the study

The issue of liquidity management has now got great attention in the Ethiopian banking industry. Moreover, the supervisory authority has required banks to have their own liquidity policy which enforces them to monitor their funding structure and their ability to handle short term liquidity

problems and provide them with a better means of assessing the present and future liquidity risk associated. Thus, this study has great contribution to the Ethiopian commercial banks to assess their liquidity requirement and to produce their liquidity policy and to give due attention on those factors which have significant impact on bank's liquidity. It has also a great contribution to the existing knowledge in the area of factors determining commercial banks liquidity. Therefore, the study as a whole will have great contribution to the supervisory authority, policy makers, commercial banks and other researchers to gain knowledge about their effect and the relationship between the bank specific factors and liquidity of commercial banks.

1.7 Organizations of the paper

The research report was organized under five chapters. The first chapter provides the general overview of the study. The second chapter reviewed the related literatures on the determinants of bank's liquidity. The third chapter focuses on the methodology of the study. The fourth chapter was provided results and discussion. The final chapter includes conclusion and recommendations and at the end references.

CHAPTER TWO

2.1 Review of Related Literature

Banks play a central role in all modern financial systems. To perform its role effectively, they must be safe and be perceived as such. The single most important assurance is the economic value of a bank's assets to be worth significantly more than the liabilities that it owes. The difference represents a cushion of "capital" that is available to cover losses of any kind. However, the global financial crisis underlined the importance of a second type of buffer, the "liquidity" that enables banks to cover unexpected cash outflows. A bank can be solvent, by holding assets that exceed its liabilities on an economic and accounting basis, and still die a sudden death if the bank does not have enough liquidity to meet its obligations when they fall due including continuing obligation such as those to fund the holding of assets (BCBS, 2004).

Most importantly, the primary role of banks in the economy is to create liquidity by funding illiquid loans with liquid demand deposits or in other words banks actually collecting short term deposit and issuing loans for long terms Diamond (1984), Ramakrishnan and Thakor (1984). This liquidity creation role exposed banks for liquidity problem that banks need to manage in order to prevent itself from a sudden death. When bank does not have enough liquidity to fulfil its obligation, the bank is said to face liquidity risk.

It is known that all businesses including banks face liquidity risk. However, the banks liquidity risk is inherent from its intermediation role of providing mismatched maturities of deposit and loans (short-term deposit for long-term loans). As a consequence, banks fundamentally need to hold an optimal level of liquidity to maintain efficiency and operative excellence.

2.2 Review of Related TheoreticalLiterature

2.2.1 ConceptualBackground

A first requirement to study bank's liquidity buffers is to find an adequate definition of liquidity. The financial economics literature distinguishes between two concepts of liquidity: market liquidity and funding liquidity Drehmann and Nikolaou, (2009). Market liquidity describes a particular characteristic of an asset: a high degree of market liquidity implies the ability to offset or eliminate a position in a given asset at or close to the current market price. This feature of the asset may not be

constant over time. An asset which is currently market liquid may not necessarily have been market liquid in the past, nor need it be continuously market liquid in the future. Factors such as market concentration or the prevalence and distribution of asymmetric information may affect the degree of marketliquidity.

Funding liquidity describes particular characteristics of a financial agent: it refers to its ability to meet obligations as they come due. Funding liquidity risk is the risk that the bank will not be able to meet efficiently both expected and unexpected current and future cash flow and collateral needs without affecting either daily operations or the financial condition of the firm. At any point in time, a financial institution is either funding liquid or not. Nevertheless, the two concepts are linked Brunner Meier,(2009). Suppose a bank only holds assets which are perfectly market-liquid. In this case the bank will also be funding liquid, as long as it is solvent. Market liquidity, however, may vary over time, and an institution's funding liquidity may thus change accordingly. Suppose a sufficiently large portion of the bank's assets suddenly become perfectly market illiquid, while the bank remains solvent. The bank will no longer be able to honor its short-term obligations and will become distressed. This is, in fact, a stylized description of the difficulties encountered by a large number of financial institutions during 2007, the previously highly liquid market for mortgage-backed securities dried up. This situation highlight the crucial importance of liquidity to the functioning of markets and the banking sector as well as links between funding and market liquidity risk, interrelationships of funding liquidity risk and credit risks, reputation effects on liquidity, and other links among liquidity and other typical bankingfeatures.

Liquidity risk refers to the risk that a financial agent will be unable to meet obligations at a reasonable cost as they come due. In other words, it reflects the probability that the agent will become funding illiquid during a given time period. As explained in the previous section, banks‟ core business is to "borrow short and lend long" they are especially prone to liquidity risk. Banks manage the liquidity risk inherent in their balance sheets by maintaining a buffer of market-liquid assets - such as cash or government securities which anticipates their depositors‟ liquidity demands within the relevant timeframe.

As pointed out by Diamond and Dybvig (1983), banks thus benefit from the ability to pool liquidity risk over a large group of depositors. It would be undesirable for banks to invest only in perfectly

market-liquid assets at all times as this would effectively eliminate the pooling advantage banks have compared to the liquidity risk management that could be undertaken by their individual customers. Yet, it would be equally undesirable for banks not to invest in market-liquid assets at all, as this would burden depositors with excessive liquidity risks.

Until recently, liquidity risk was not the main focus of banking regulators. The 2007-2009 crisis showed, however, how rapidly market conditions can change exposing severe liquidity risks in institutions, many times unrelated to capital levels. Now, there is wide agreement that insufficient liquidity buffers were a root cause of this crisis and the on-going disruptions of the world financial system, making the improvement of liquidity risk analysis and supervision a key issue for the years to come Brunnermeier, (2009) and BCBS, (2008).

Efforts are underway internationally as well as in individual countries to establish or reform (existing) liquidity risk frameworks, most notably by the Basel Committee for Banking Supervision (BCBS). The BCBS‟s new regulatory framework (Basel III) proposes a short and long-term liquidity requirement to reinforce the resilience of banks to liquidity risks BCBS, (2010) and BCBS, (2013). The Liquidity Coverage Ratio (LCDR) is a short-term ratio requiring financial institutions to hold enough liquid assets to withstand a thirty day stress period. The second measure, the Net Stable Funding Ratio (NSFR) aims at improving banks‟ longer-term, structural funding. BCBS (2013) also requires institutions to disclose certain elements regarding their fulfilment of these minimum requirements. Recently the European Systemic Risk Board (ESRB) has recommended national supervisory agencies to intensify the supervision of liquidity and funding risks as well ESRB,(2013).

2.2.2 Bank liquidity Creation and Financial FragilityTheory

According to the theory of financial intermediation, an important role of banks in the economy is to provide liquidity by funding long term illiquid assets with short term liquid liabilities. Through this function of liquidity providers, banks create liquidity as they hold illiquid assets and provide cash and demand deposits to the rest of the economy. Banks perform valuable activities on either side of their balance sheets; on the asset side, they make loans to illiquid borrowers and on the liability side, they provide liquidity on demand to depositors. As of Diamond and Rajan (1998) depositors get better access to their funds than they would if they invested directly and earned the same

expected return: this is liquidity creation. Borrowing firms too can find the bank to be a more reliable source of funding than another firm or individuals: banks insure borrowers against the liquidity risk that funding will be cut off prematurely. Diamond and Dybvig (1983) emphasize the "preference for liquidity" under uncertainty of economic agents to justify the existence of banks: banks exist because they provide better liquidity insurance than financial markets; however, as banks are liquidity insurers they face transformation risk and are exposed to the risk of run on deposits. In general, the higher is liquidity creation to the external public; the higher is the risk for banks to face losses from having to dispose of illiquid assets to meet the liquidity demands of customers.

The usual justification for the existence of deposit taking institutions, thereby giving an explanation for the economically important role of banks in providing liquidity, was initially modelled by (Bryant 1980; Diamond and Dybvig(1983). They showed that by investing in illiquid loans and financing them with demandable deposits, banks can be described as pools of liquidity in order to provide households with insurance against idiosyncratic consumption shocks. However, this structure is also the source of a potential fragility of banks since in case of an unexpected highnumber of depositors deciding to withdraw their funds for other reasons than liquidity needs, a bank run will result.

Kashyap et.al (2002) conducted a related analysis justifying the existence of bank's liquidity creation. They argued that as banks carry out lending and deposit taking under the same roof, synergies must exist between these two tasks. These synergies can be found in the way deposits and loan commitments are secured through the holding of liquid assets as collateral against withdrawals. They regard these liquid assets as costly overheads. Diamond and Rajan (2005) provides a detailed analysis of the link between liquidity shortages and systemic banking crises. It is argued that the failure of a single bank can shrink the pool of available liquidity to the extent that other banks could be affected by it. Generally, liquidity risk arises from the fundamental role of banks in the maturity transformation of short-term deposits into long term loans.

2.2.3 Quantitative Framework for Measuring Bank'sLiquidity

Financial institution can mobilizes resources through new deposits, maturing assets, borrowed funds and/or using the discount window (borrowing from the central bank). While financial

institution may encounter liquidity risk. According to Rochet (2008), the three sources of liquidity risk are; on the liability side, there is a large uncertainty on the volume of withdrawals of deposits or the rolled- over of inter-bank loans, on the asset side, there is an uncertainty on the volume of new requests for loans that a bank will receive in the future, and off-balance sheet items, like credit lines and other commitments taken by the bank.

Some of the mechanisms to insure liquidity crises are: banks hold buffer of liquid assets on the asset side of the balance sheet such as cash, balances with central banks and other banks, debt securities issued by governments and similar securities or reverse repo trades reduce the probability that liquidity demands threaten the viability of the bank. The second strategy is, banks can rely on the interbank market where they borrow from other banks in case of liquidity demand. The last strategy is that, the central bank typically acts as a Lender of Last Resort/LOLR to provide emergency liquidity assistance to particular illiquid institutions and to provide aggregate liquidity in case of a system-wide shortage Apaches et al. (2005).

The two most widely used approaches to measure liquidity of banks are by liquidity gap approach (flow perspective) or liquidity ratio approach (stock perspective). The liquidity gap/flow approach treats liquidity reserves as a reservoir which the bank assesses its liquidity risk by comparing the variability in inflows and outflows to determine the amount of reserves that are needed during the period. The liquidity gap approach adapts the variation between assets and liabilities both current and future period. A positive liquidity gap means for deficit, requiring for liabilities to be increased Bassis, (2009).

The liquidity ratio/stock approach, in contrast, employs various balance sheet ratios to identify liquidity trends. The various ratios label for immediate viable source of funding. This indeed entitles portfolio of assets that can be sold off without any fuss and also adequate amounts of stable liabilities. Various authors like Moor (2010), Rychtarik (2009), or Praet and Herzberg (2008) have also provided similar understandings with liquidity ratios such as liquid assets to total assets, liquid assets to deposits, loans to total assets and loans to deposits. In short, the liquidity ratio carries varies balance sheet ratios to identify liquidityneeds.

Though both approaches are intuitively appealing, the flow approach is more data intensive and

there is no standard technique to forecast inflows and outflows. As a result, the stock approaches are more popular in practice and the academic literatures, due to the availability of more standardized method Crosse and Hempel (1980); Yeager and Seitz, (1989); Hempel et al. (1994). According to Crosse and Hempel (1980), the most popular stock ratios are liquid asset to deposit, loan-to-deposit ratio and the liquid asset-to-total asset ratio. When the higher the loan-to-deposit ratio (or the lower liquid asset to deposit ratio and the liquid asset-to-total asset ratio) the less able a bank to meet any additional loan demand (indicate for less liquidity). Both indicators have their shortcomings: the loan-to-deposit ratio does not show the other assets available for conversion into cash to meet demands for withdrawals or loans, while the liquid assets ratio ignores the flow of funds from repayments, increase in liabilities and the demand for bank funds. Nevertheless, according to Crosse and Hempel (1980), these ratios likely to move in parallel trend.

Hence, to meet the objectives of this study, the liquidity ratio/stock approach was chosen over the flow/liquidity gap approach. The researcher chooses to employ three liquidity ratios to overcome theshortcomingsofonefromtheother.Theresearchermainlychoosestheliquidasset-to-total asset ratio because the liquidity framework from NBE is favorable towards this ratio.

2.2.4 Determinants of Bank Liquidity

The determinants of bank's liquidity level can be classified into four broad categories.

2.2.4.1 Bank Specific Characteristics

The internal (bank-specific) factors are factors that are related to internal efficiencies and managerial decisions. Such factors include determinants such as capital adequacy, bank size, capitaladequacy, and cost of financial intermediation, depositgrowth, loan to total asset, market concentration and National bank bill.

Bank Size and Bank Liquidity

When bank size grows it will help them to overcome the risk but it should be noted that it may leads also to failure. According to the "too big to fail" argument, large banks would benefit from an implicit guarantee, thus decrease their cost of funding and allows them to invest in riskier assets Iannotta et al. (2007). If big banks are seeing themselves as "too big to fail", their motivation to hold liquid assets is limited. In case of a liquidity shortage, they rely on a liquidity assistance of Lender of Last Resort Vodova,(2011). Thus, large banks are likely to perform higher levels of liquidity creation that exposes

them to losses associated with having to sale illiquid assets to satisfy the liquidity demands of customers Kiyotaki and Moore,(2008). Therefore, "too big to fail" status of large banks could lead to moral hazard behavior and excessive risk exposure and thus there can be negative relationship between bank size and liquidity. In agreement for positive relationship between bank size and liquidity (Rauch et al ,2009 and Berger and Bouwman (2009), state that smaller bank tend to emphasis on intermediation processes and transformation activities and they do have smaller amount of liquidity. Hence, there can be positive relationship between bank size and liquidity.

Capital Adequacy and Bank Liquidity

Capital can be defined as common stock plus surplus fund plus undivided profits plus reserves for contingencies and other capital reserves. Besides, a bank's loan loss reserves which serve as a buffer for absorbing losses can be included as bank's capital Patheja(1994). The primary reason why banks hold capital is to absorb risk including the risk of liquidity crunches, protection against bank runs, and various other risks. According to Moh"d and Fakhris (2013), bank's capital plays a very important role in maintaining safety and solidarity of banks and the security of banking systems in general as it represents the buffer gate that prevents any unexpected loss that banks might face, which might reach depositors funds given that banks operate in a highly uncertain environment that might lead to their exposure to various risks and losses that might result from risks facing banks. The recent theories suggest that, bank capital may also affect bank's ability to create liquidity. These theories produce opposing predictions on the relationship between capital and liquidity creation.

Under the first view, the "financial fragility-crowding out" theories predicts that, higher capital reduces liquidity creation and lower capital tends to favor liquidity creation Diamond and Rajan, (2000, 2001). They stated that, depositors will be charged a nominal fee for the intermediary service of loaning out their respective deposits. However, this fee differs according to the borrowers" capability of repayment. For those with higher risk borrowing but are reluctant to incur higher cost, will provoke depositors to withdraw their funds. Furthermore, Gorton and Winton (2000) show that a higher capital ratio may reduce liquidity creation through another effect: "the crowding out of deposits". They consider that deposits are more effective liquidity hedges for agents than investments in bank equity. Indeed, deposits are totally or partially insured and withdrawable at par value. By contrast, bank capital is not eligible and with a stochastic value that depends on the state of bank fundamentals and on the liquidity of the stock exchange. Consequently, higher capital ratios shift investors" funds from relatively liquid deposits to

relatively illiquid bank capital. Thus, the higher is the bank's capital ratio; the lower is its liquidity creation.

The second view is that, higher capital requirement provide higher liquidity to financial institutions. Where risk absorption theory is realized for higher capital improves the ability of banks to create liquidity. This evidence is provided by Diamond and Dybvig (1983) and Allen and Gale (2004) stating that liquidity creation exposes banks to risk. The greater liquidity needs of banks, incur higher losses due to the disposal of illiquid assets at available market prices rather than the desired prices to meet the customers‟ obligations. Al-Khouri (2012) has also found that, bank capital increases bank liquidity through its ability to absorb risk. Thus, under the second view, the higher is the bank's capital ratio, the higher is its liquidity creation.

Deposit Growth

Deposit mobilization is defined by Elser et al (1999) as the process of encouraging customers to deposit cash with the bank or attracting new clients to come and open accounts with the bank. From an institutional perspective, the primary motive for mobilizing savings lies in lower cost of capital compared to other sources of funds. According to Kutanet al (2010) banks serve as intermediaries accepting commercial and individual deposits (savings) and transferring them in the form of loans to investments. Different arguments and theories have been put forward to explain the different facts about bank deposit. In order to put the study within the context of the existing literature, the subsequent section of this chapter focuses on the theoretical review, the empirical review and other core aspects of the topic under study. In the theoretical part the theories that states about the commercial banks deposits. The empirical literature part discusses past studies that were conducted on the related area of factors determining commercial banks deposit growth and the variables that affect bank deposit.

Moussa (2015) found an insignificant effect of deposits on bank liquidity. Bonner et al. (2013) and Kashyap et al.(2002) argued that as demand deposits increase, liquidity asset holdings also increase. Alger and Alger (1999) provided empirical insights into liquid assets held by Mexican banks. This study summarized 10 predictions based on various theories and applied panel data estimates from January 1997 to March 1999. They assumed that at a given level of deposits, if there is more risk for borrowers as in the case of economic recession, liquid assets should also be increased by banks. Dinger (2009) studied emerging economies for the period of 1994 to 2004 and found that as the deposit rate increases bank

liquidity decreases.

When there is a sudden and increased demand of cash by depositors, banks are forced to borrow from the inter-bank market or the central bank. On the contrary, if banks maintain adequate liquidity, they become less dependent on external sources of funding. This means that as funding cost increases, banks would hold more liquidity themselves. Thus, we propose: Moussa found an insignificant effect of deposits on bank liquidity. Bonner et al. (2013) and Kashyap et al.(2002) argued that as demand deposits increase, liquidity asset holdings also increase. Alger and Alger (1999) provided empirical insights into liquid assets held by Mexican banks. This study summarized 10 predictions based on various theories and applied panel data estimates from January 1997 to March 1999. They assumed that at a given level of deposits, if there is more risk for borrowers as in the case of economic recession, liquid assets should also be increased by banks. Dinger (2009) studied emerging economies for the period of 1994 to 2004 and found that as the deposit rate increases bank liquidity decreases.

Non-performance loan and Bank Liquidity

Loans & advances whose credit quality has deteriorated such that full collection of principal and/or interest in accordance with the contractual repayment term of the loan or advance is in question (NBE directive No.SBB/43/2008). According to (Ghafoor, 2009), non-performance loanare loans that a bank customer fails to meet his/her contractual obligations on either principal or interest payments exceeding the scheduled repayment dates. Thus, NPLs are loans that give negative impact to banks in developing the economy. Rise of non-performing loan portfolios significantly contributed to financial distress in the banking sector.

The banking systems play the central role of mobilizing and allocating resources in the market by channeling fund from surplus economic units to deficit economic units. This activity of transforming short term deposit to long term loans & advances will generate most profits for banks. However, it involves high risk and eventually if not managed properly will leads to high amount of non-performing loans. The increased on non-performing loan reflects deteriorated asset quality, credit risk and its inefficiency in the allocation of resources. According to Bloem and Gorter (2001), though Non-performance loan may affect all sectors, the most serious impact is on financial institutions which tend to have large loan portfolios. On the other hand, large volume of non- performing loans portfolio will affect the ability of banks to provide credit and leads to loss of confidence and liquidity problems. Therefore, the amount of Non-performance loan has a negative impact on bank's liquidity.

Market Concentrations (HHI)

Market concentration could measures the degree of competition each bank faces in the market. This indicator is measured by the concentration index in asset terms. Herfindahl-Hirschman index (HHI) is calculated by the sum of squares of total asset shares of all banks in the market. A higher concentration level means more power for the banks, which will result in higher interest margins. The literature suggests two opposite hypotheses related to the effect of concentration on banks price behavior. The first hypothesis is the one so called structure-performance-hypothesis (SPH) which argues that a more concentrated banking sector will behave oligopolistically and a higher concentration will cause higher interest margin for the banks. The second one, the efficient-structure-hypothesis (ESH) confirms that concentration produces efficiency gains (because of cost reductions) causing interest margins decrease. Another reason may be that big banks have a different structure of earning assets or paying liabilities compared to smaller banks, which may affect the interest received or paid and consequently the interest margins.

The Herfindahl-Hirschman index (HH index) is viewed in the literature as a measure of concentration the extent to which a few banks dominate market shares in respect of total assets, loans, or deposits. The HH index is a standard measure of consolidation in any industry and it is defined as the sum of the squared deposit, asset, or loan shares of all the banks in the market. By construction, the HH index has an upper value of 10,000 in the case of a monopolistic firm with a 100 percent share of the market; the index tends to zero in the case of a large number of firms with very small market shares.

National bank bills

Bond is a debt instrument issued for a period of more than one year with the purpose of raising capital by borrowing. The Federal government, states, cities, corporations, and many other types of institutions sell bonds. Generally, a bond is a promise to repay the principal along with interest (coupons) on a specified date (maturity). Some bonds do not pay interest, but all bonds require a repayment of principal. However, the buyer does not gain any kind of ownership rights to the issuer, unlike in the case of equities. On the hand, a bond holder has a greater claim on an issuer's income than a shareholder in the case of financial distress (this is true for all creditors). Bonds are often divided into different categories based on tax status, credit quality, issuer type, maturity and secured/unsecured (and there are several other ways to classify bonds as well). The yield from a bond is made up of three components: coupon interest, capital gains and interest on interest (if a bond pays no coupon interest, the only yield will be capital gains). Some bonds

are tax-exempt, and these are typically issued by municipal, county or state governments, whose interest payments are not subject to federal income tax, and sometimes also state or local income tax. (Downloaded from www.investorwords.com, Feb.2013).

Commercial banks in Ethiopia purchase bills as an investment in order to use idle funds at their disposal and thereby earning interest that will help cover the cost of acquiring funds. To the contrary, The National Bank of Ethiopia as a regulatory body issues bills for two main reasons: the first purpose is collecting excess money circulating in the economy that is using the bill as a tool for the country's monetary policy and financing government projects there by funding budget deficits from local sources at a lower interest rate. It is evident that the country has been suffering from budget deficit for a long period of time and recently the Ethiopian government has introduced "The GTP (The great transformation plan)" and there are enormous projects from railways to electric power station which require a huge amount of fund and commercial banks and international organization like the IMF and World Bank associate the bill policy with the GTP and the ongoing projects in line with the plan.

The bill policy as claimed by commercial banks is sucking up funds that could otherwise have be forwarded to the market as loan thereby taking away one major source of income for them. This is forcing commercial banks to highly depend on income generated from bank fees and foreign trade but, as indicated on the annual reports of these banks income generated from bank fees is very insignificant (taking out Commercial Bank of Ethiopia) which in turn forces banks to highly depend on income generated from foreign trade. To the contrary the National Bank claims that commercial banks are not adequately allocating funds for long term projects which is taken as a rationale for putting out the policy, as long term projects are corner stone's for facilitating and maintaining the economic growth of the country. The liquidity position of banks has also been deteriorating since the policy came in to effect. Maintaining a good and reliable liquidity position has been an issue for banks operating in the country since before the policy came in to effect and the policy is said to aggravate this problem further putting the banks in a very critical position. The National Bank of Ethiopia understanding this problem has lowered the reserve requirement of banks from 15% to 10% on January 2012 and further to 5 % but, Banks are still questioning the adjustment as it fails short to mitigate the liquidity problem.

On analysis, NPLs are found to affect liquidity. Firstly, Toby (2008), in his study quoted that the use of minimum liquidity ratio (MLR) as a monetary policy tool has an inverse association with industry asset quality measured with NPLs. As MLR rises further coupled with an outcome where bank liquidity ratio (BLR) rises, industry NPLs are expected to fall, and vice-versa. Hence, he concluded that the reason behind scheming excess

liquidity may bring about adverse outcomes increasing NPLs. Equally, Joseph, Edson, Manuere, Clifford and Michael (2012), further findings indicate that NPLs have a negative relationship towards banks performance be it liquidity or profitability.

2.3 Review of Related EmpiricalStudies

This section gives a brief review of the previous studies made on the determinants of bank's liquidity from both developed and developing nations. Moreover, most of the studies undertaken on bank liquidity consider both bank specific and macroeconomic factors to examine the determinants of liquidity of banks. So, the studies conducted in related to bank's liquidity are reviewed as follows.

2.3.1 Related Empirical Studies in AdvancedCountries Related

Bank specific and macroeconomic determinants of liquidity of English banks were studied byAspachs et al, (2005). The researchers used unconsolidated balance sheet and profit and loss data for a panel of 57 UK-resident banks, on a quarterly basis, over the period 1985 to 2003. Theyassumed that the liquidity ratio as a measure of the liquidity was dependent on the following factors: Probability of obtaining the support from LOLR, which should lower the incentive for holding liquid assets, interest rate margin as a measure of opportunity costs of holding liquid assets expected to have negative impact, bank profitability which is according to finance theory negatively correlated with liquidity, loan growth, where higher loan growth signals increase in illiquid assets, size of the bank expected to have positive or negative impact, gross domestic product growth as an indicator of business cycle negatively correlated with bank liquidity, and short term interest rate, which should capture the monetary policy effect with expected negative impact on liquidity.

The study made on bank specific determinants of liquidity on English banks studied Valla et al. (2006) and assumed that, the liquidity ratio as a measure of the liquidity should be dependent on the following factors: bank profitability and loan growth had negatively correlated with liquidity while size of the bank is ambiguous. Liquidity created by Germanys state-owned savings banks and its determinants has been analyzed by Rauch et al. (2009). In the first step they attempted to measure the liquidity creation of all 457 state owned savings banks in Germany over the period 1997 to 2006 and they analyzed the influence of monetary policy on bank liquidity creation. To measure the monetary policy influence, the study developed a dynamic panel regression model. According to this study, the following factors determine bank liquidity: monetary policy interest rate, where tightening monetary policy expected to reduces bank liquidity, level of unemployment, which is connected with demand for loans having negative impact on

liquidity, savings quota affect banks liquidity positively, size of the bank measured by total number of bank customers have negative impact, and bank profitability expected to reduce banks liquidity.

Vodova (2011) examined the determinants of liquidity of commercial banks in Czech Republic through four liquidity ratios and related them with bank specific and macroeconomic data over a period from 2001 to 2010. This study observed drop of bank's liquidity as a result of the Global financial Crisis. The study reveals that the share of liquid assets in total assets and liquid asset in deposits and short term funding decreases with bank profitability, higher capital adequacy and bigger size of banks. In their opinion big banks rely on the interbank market and on liquidity assistance of Lender of Last Resort (LOLR). Liquidity measured by share of loans in total assets and in deposits and short term borrowings increases with growth of domestic product. They did not find any significant relationship between interest rates on loans, interest rate on interbanktransactions or monetary policy interest rates, interest rate margins, the share of Non-performance loanand the rate of inflation with liquidity.

The study made by Lucchetta (2007) on the hypothesis that "interest rates affect bank's risk taking and the decision to hold liquidity across European countries". The liquidity measured by different liquidity ratios should be influenced by behavior of the bank on the interbank market. The more liquid the bank is, the more it lends in the interbank market. The results of the study revealed that the risk-free interest rate negatively affects the liquidity retained by banks and the decision of a bank to be a lender in the inter-bank market. Conversely, the inter-bank interest rate has a positive effect on such decisions. Typically, it is the smaller, risk-averse banks that lend in the inter-bank markets. Meanwhile, the risk-free interest rate is positively correlated with loans investment and bank risk-taking behavior.

Vodova (2013) had also studied on the determinants of liquidity of Polish commercial banks. The data cover the period from 2001 to 2010. The results of panel data regression analysis showed that bank

liquidity is strongly determined by overall economic conditions and dropped as a result of financial crisis, economic downturn and increase in unemployment. Bank liquidity decreases also with higher bank profitability, higher interest rate margin and bigger size of banks. On contrary, bank liquidity increases with higher capital adequacy, inflation, share of nonperforming loans and interest rates on loans and interbank transaction

2.3.2 Related Empirical Studies in Emerging Economies

Moore (2010) investigated the effects of the financial crisis on the liquidity of commercial banks in Latin America and Caribbean countries and specifically addresses the behavior of commercial bank liquidity during crises in Latin America and the Caribbean. They identify the key determinants of liquidity, and to provide an assessment of whether commercial bank liquidity during crises is higher or lower than what is consistent with economic fundamentals. The regression model was estimated by using ordinary least squares. The result of the study showed that the volatility of cash- to-deposit ratio and money market interest rate have negative and significant effect on liquidity. Whereas, liquidity tends to be inversely related to the business cycle in half of the countries studied, suggesting that commercial banks tend to error on the side of caution by holding relatively more excess reserves during downturns.

Karlee et al. (2013) studied the determinants of liquidity of 15 commercial banks in Malaysia in period (2003-2012). They used bank specific factors; size of bank, capital adequacy, profitability, credit and macroeconomic factors such as GDP, interbank rate, financial crisis. The empirical results show that all factors included are significant except interbank rate. The factors with positive influence on bank liquidity are Non-Performing Loan, Profitability and Gross Domestic Product. On the other hand, factors to bring negative effect to bank's liquidity are Bank Size, Capital Adequacy, and Financial Crisis. While Interbank Rate turned out insignificant

The other study made by Vodová (2012) aimed to identify the determinants of liquidity of commercial banks in Slovakia. In order to meet its objective the researcher considered the data for bank specific factors over the period from 2001 to 2009. The data was analyzed with panel data regression analysis by using an econometric package Eviews7and the findings of the study revealed that bank liquidity decreases mainly as a result of higher bank profitability, higher capital adequacy and with the size of bank. The level of Non-performance loan has no statistically significant effect on the liquidity of Slovakia commercial banks.

In another study from Pakistan, Malik and Rafique (2013) examines bank specific and macroeconomic determinants of commercial bank liquidity in Pakistan. Their study period covers from 2007 to 2011. They have used two models of liquidity. The first model L1 is based on cash and cash equivalents to total assets. The second model L2 is based on advances net of provisions to total assets. Their results suggest that, Non-Performing Loan (NPL) and Return on Equity (ROE) have a negative and significant effect with L1. Capital adequacy (CAP) and inflation (INF) are negatively and significantly correlated with L2, Additionally there is a significant and positive impact of financial crisis on the liquidity of commercial banks. The central bank regulations greatly affect the liquidity of commercial banks which means tight monetary policy can regulate the undesirable effect of inflation on liquidity.

The study made by Vodová (2013) with the aim of identifying the determinants of liquidity of Hungarian commercial banks which cover the period from 2001 to 2010 and used panel data regression analysis. The result of the study showed that bank liquidity is positively related to capital adequacy of banks, interest rate on loans and bank profitability and negatively related to the size ofthe bank, interest rate margin, monetary policy interest rate and interest rate on interbank transaction.

Sushil et al (2013) had made a study on the relationship between liquidity of selected Nepalese commercial banks and their impact on financial performance and found that capital adequacy, share of Non-performance loanin the total volume of loans had negative and statistically significant impact on banks liquidity whereas loan growth, growth rate of gross domestic product on the basis price level, liquidity premium paid by borrowers and short term interest rate had negative and statistically insignificant impact on banks liquidity. Bank size had positive and significant impact and inflation rate had positive and insignificant impact on banks liquidity.

2.3.3 Related Empirical Studies in African Countries

Chagwiza (2011) made a study on Zimbabwe, regarding the commercial banks liquidity and its determinants. The main objective of his study was to identify the determinants of liquidity in Zimbabwean commercial banks. The result of his study revealed that, there is a positive link between

bank liquidity and capital adequacy, total assets, gross domestic product and bank rate. While the adoption of multi-currency, inflation rate and business cycle have a negative impact on liquidity. The other studies made by Laurine (2013) in Zimbabwe regarding Zimbabwean Commercial Banks Liquidity Risk Determinants after dollarization. The aim of his paper was that empirically investigating the determinants of Zimbabwean commercial banks liquidity risk after the country adopted the use of multiple currencies exchange rate system. To attain the intended objective, panel data regression analysis was used on monthly data from the period of March 2009 to December 2012. The result of the study revealed that, capital adequacy and size have negative and significant influence on liquidity risk whereas spread and Non-performance loan have a positive and significant relationship with liquidity risk. Reserve requirement ratios and inflation were also significant in explaining liquidity during the studied period.

Agbada and Osuji (2013) studied the efficacy of liquidity management and banking performance in Nigeria using survey research methodology. Data obtained were first presented in tables of percentages and pie charts. The data were empirically analyzed by Pearson product-moment correlation coefficient. Findings from the empirical analysis were quite robust and clearly indicatethat there is significant relationship between efficient liquidity management and banking performance and that efficient liquidity management enhances the soundness of a bank.

A study made by Fadare (2011), on the banking sector liquidity and financial crisis in Nigeria with the aim of identifying the key determinants of banking liquidity and assessing the relationship between determinants of banking liquidity and financial frictions within the economy. It was employed a linear least square model and time series data from 1980 to 2009. The study found that monetary policy rate and lagged loan-to-deposit ratio were significant for predicting banking sector liquidity. It also showed that a decrease in monetary policy rate, volatility of output in relation to trend output, and the demand for cash, leads to an increase in current loan-to-deposit ratios; while a decrease in currency in circulation in proportion to banking sector deposits; and lagged loan-to- deposit ratios leads to a decline in current loan-to-deposit ratios.

The other study made by Mohamed(2015) on Tunisia banks shows that , financial performance, capital / total assets, operating costs/ total assets, growth rate of GDP, inflation rate, delayed liquidity have significant impact on bank liquidity while size, total loans / total assets, financial costs/ total credits, total deposits / total assets does not have a significant impact on bank liquidity.

2.3.4 Related Empirical studies in Ethiopia

Tseganesh (2012) made study on determinants of banks liquidity and their impact of financial performance on commercial banks in Ethiopia. The aim of her study was concerned with two points; identify determinants of commercial banks liquidity in Ethiopia and see the impact of banks liquidity up on financial performance through the significant variables explaining liquidity. The data was analyzed by using balanced fixed effect panel regression model for eight commercial banks in the sample covered the period from 2000 to 2011 and the result of her study indicate that capital adequacy, bank size, share of nonperforming loans in the total volume of loans, interest rate margin, inflation rate and short term interest rate had positive and statistically significant impact on banks liquidity whereas real GDP growth rate and loan growth had statistically insignificant impact on banks liquidity. Also the result of her study revealed that; among the statistically significant factors affecting banks liquidity, capital adequacy and bank size had positive impact on financial performance whereas, Non-performance loanand short term interest rate had negative impact on financial performance while interest rate margin and inflation had negative but statistically insignificant impact on financial performance. At the end she concluded as, the impact of bank liquidity on financial performance was non-linear/positive and negative.

Also other study made by Worku (2006) in Ethiopia regarding liquidity and its impact on performance of commercial banks. And he argued that liquidity has an impact on the performance of commercial banks in Ethiopia and there was an inverse relation between deposit/net loan and ROE. And the coefficient of liquid asset to total asset was positive and directly related with ROE. Also in the same year, the researcher studied capital adequacy and found that the capital adequacy of all banks in Ethiopia were above threshold, means there was sufficient capital that can cover the risk-weighted assets.

Depositors who deposit their money in all banks were safe because all the studied banks fulfilled NBE requirement Worku(2006).Also Semu (2010) conducted study with the intension to assess the impact of reducing or restricting loan disbursement on the performance of banks in Ethiopia. It also attempts to examine the possible factors that compel the banks to reduce or restrict lending. For his study, the researcher used Quantitative method particularly survey design approach was adopted. The finding of the study revealed that deposit and capital have statistically significant relationship with banks‟ performance measured in terms of return on equity (ROE). New loan and liquidity have relationship with banks‟ performance measured in terms of both return on asset (ROA) and ROE. However, the relationship was found to be statistically insignificant. Deposit and capital have no statistically significant relationship with banks‟ performance in terms of ROA. The study suggested that when banks face lending constraints,

they have to use their funds like by purchasing treasury bills and bonds. Moreover, banks must develop non-interest generating services. Excess cash maintained by banks should be used by diversifying credit options and to avoid inefficiencies.

Alemayehu(2016) also conduct the researcher is to identify the factors significant to explain Ethiopian commercial Banks liquidity. This study has categorized the independent factors into bank specific factors and macroeconomic factors. The bank specific factors include Bank Size, Capital Adequacy, Profitability, Non-Performing Loans, and Loan Growth while the macroeconomic factors include Gross Domestic Product, General Inflation and National bank Bill. The panel data was used for the sample of eight commercial banks in Ethiopia from 2002 to 2013 year and estimated using Fixed Effect Model (FEM), data was present by using descriptive statistics and the balanced correlation and regression analysis for liquidity ratios was conducted. The findings of the study show that capital strength and profitability had statistically significant and positive relationship with banks' liquidity. On the other hand, loan growth and national bank bill had a negative and statistically significant relationship with banks' liquidity. However, the relationship for inflation, non-performing loans, bank size and gross domestic product were found to be statistically insignificant. The study suggests banks must have increase their outreach to tens of millions of people by openings up more and more branches every year through country, and have significantly improve their banking service by introducing new product and services like Agent banking, Mobile banking and Internet Banking through the application of modern technology. Moreover, banks in Ethiopia should not only be concerned about internal structures and policies, but they must consider both the government regulation and the macroeconomic environment together in developing strategies to improve the liquidity position of the banks.

Nigist (2015) also studied identify the impact of macroeconomic factors on liquidity of Ethiopian commercial banks. The data covered the period from 2007-2013 for the sample of ten commercial banks in Ethiopia and used secondary data. Macro-economic variables were analyzed by employing the balanced panel fixed effect regression model and the result of the study revealed that real GDP growth rate have negative and statistically significant impacts on liquidity of Ethiopian commercial banks whereas inflation rate, and interest rate margin were found to be statistically insignificant/ has no any impact on liquidity of Ethiopian commercial banks for the tested period. Keywords: Balanced panel data, Ethiopian commercial banks, and macro-economic variables.

Belete(2015) the researcher has examined the bank-specific and macro-economic factors affecting bank liquidity for eight commercial banks in Ethiopia, covering the period of 2002-2013 by using balanced fixed effect panel regression. To this end, the researcher has adopted a mixed methods research approach by combining documentary analysis and in-depth interviews. The findings of the study show that capital strength, interest rate margin and inflation had statistically significant and positive relationship with banks' liquidity. On the other hand, loan growth had a negative and statistically significant relationship with banks' liquidity. However, the relationship for profitability, non-performing loans, bank size and gross domestic product were found to be statistically insignificant. The researcher suggests that focusing and reengineering the banks alongside the key internal drivers could enhance the liquidity position of the commercial banks in Ethiopia. Moreover, banks in Ethiopia should not only be concerned about internal structures and policies, but they must consider both the internal environment and the macroeconomic environment together in developing strategies to improve the liquidity position of the banks.

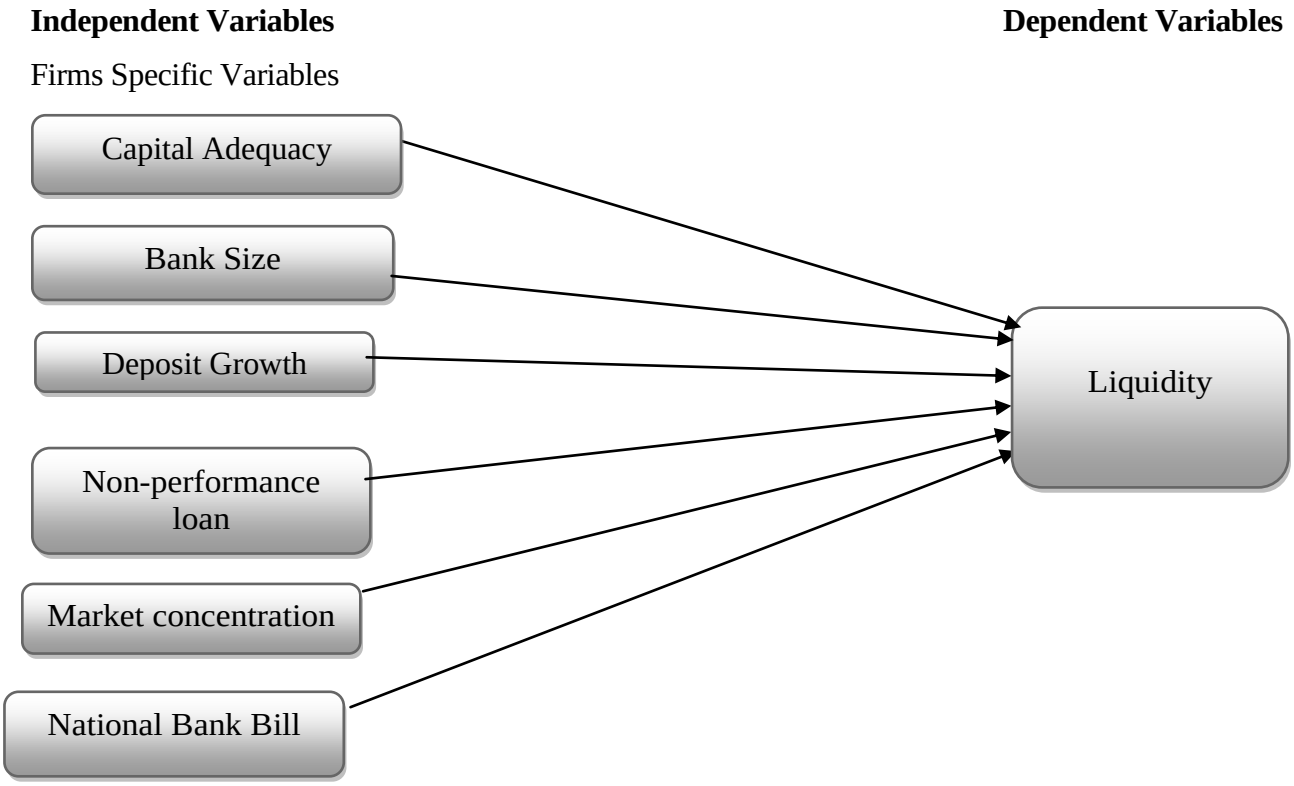
2.4 Summary and knowledge Gap

From the above empirical literature review what can draw in that, though there are a lot of researches conducted by different researchers, their result varies or lack of consistencies. For instance Tseganesh(2012),Mekbib(2016) and Berhanu(2015) found that bank size has a significant effect on liquidity but Belete(2015) found that it has insignificant result. When it comes to the variable Capital adequacy Tseganesh (2012) found that a significant result but Mekbib(2016) found that insignificant result. And Tseganesh(2012) found that non-performing loan has spastically significant result but Nigist(2015) insignificant result. Therefore, the purpose of this study was to fill the above stated gap by analyzingfirm specific determinantsof private banks liquidities in Ethiopia. The period of this study was recent from period 2000-2015 and adding new variables. Finally, providing full information about the relationship between liquidity and firm specific determinants of banks liquidities in the recent data was essential for this study.

2.5 Conceptual Framework

Conceptual framework as depicted in the below figure 2.1, demonstrates a potential link between independent variables with the dependent variable. In other word, it indicates the cause and effect relationship between firm specific factors with dependent variable.

Figure 2.1: Conceptual Framework



Source: Researcher's own construction based on his literature review

Chapter Three

3.1 Research Design and Methodology

In this chapter, researcher would brief about the research methodology. The researcher adapt secondary data from different resources. The data are collected from annual reports of each bank for firm's specific factors. Method employed to carry out this research project were E-view 7.

3.2 Research Design

Research design is the program that guides the researcher's in the process of collecting, analyzing and interpreting the data Creswell (2013). The objectives of this research were to investigate the determinants of banks liquidity in Ethiopian. To analyze of this study, the researcher employedexplanatory researchdesign. The purpose of this paper is to determine the relationship between dependent and independent variables affects banks liquidity. The other reason for selecting this method was the support of numerous literatures on the relevant studies, where they employ quantitative methods to investigate their research problems and verify their hypothesis.

3.3 Research Approach

As described by Creswell (2013), there are three common approaches to conduct a research project in the area of business and social sciences research namely; quantitative, qualitative, and mixed research approaches. With quantitative approach, the researcher primarily uses postpositive claims for developing knowledge, employs inquiry strategies such as experiments and surveys, and also collects data on pre specified instruments that yield statistical data. In order to achieve the objectives of this study and thereby to give answer for its problems, quantitative research approach was used by the researcher due to appropriateness. By using such research approach the researcher enabled to establish a cause-effect relationship between the independent and dependent variables of the study, by testing various hypothesis and theories thereby generalized about determinants of liquidity of commercial banks in Ethiopia.

3.4 Data type and sources

The study was conducted using secondary data, obtained fromaudited financial statements balance sheet and Profit & Loss Statement of each selected private commercial banks included in the sample data were collected from NBE.

3.5 Method of data collection

Document review method was used by the researcher in order to collect all the necessary information thereby to achieve the objective of the study. As a secondary data collection tool for this study, document review mainly focus on reviewing audited financial statement of sample six banks in Ethiopia to obtain necessary figures those enabled the researcher. The data were collected from 2000 to 2015 on annual base and the figures for the variableswere on June 30th of each year under study.

3.6 Study Population & Sampling Frame

The current information from NBE (2016), there are sixteen banks are operating in Ethiopia. Among these one was state owned and the remaining are privately incorporated banks.The researcher, purposively select those banks over the period of 2000 to 2015.Accordingly, six sample banks were selected for this study.

The sampling technique used in this research is a non-probabilistic sampling and among the non-probabilistic sampling methods, this research uses purposive sampling. As stated by Saunders et al (2009), purposive sampling is often used when working with small samples and when we wish to select cases that are particularly informative. Thus the researcher used purposive sampling by considering the availability of full data for the selected time period. In Ethiopia, there are sixteen commercial banks of which one of them are publicly owned and fifteen of them are privately owned. Among the fifteen private commercial banks, six of them have more than fifteen years of data. These banks are; Dashen Bank, Awash International Bank, Bank of Abyssinia, Wegagen Bank, NIB International Bank and United Bank. In order to have balanced panel data for sixteen years, those private commercial banks which have less than sixteen years in operation are not selected for this study. Therefore, six private commercial banks were selected and it was possible to draw a relationship among variables using 90 observations (6 banks x 16 year's data).

3.7 Literature driven hypothesis and Operational definition.

3.7.1 Dependent Variables

Liquidity of Banks: Bank for International Settlements (2008) defines liquidity as "the ability of bank to fund increases in assets and meet obligations as they come due, without incurring unacceptable losses". Liquidity can also be defined as a measure of the relative amount of asset in cash or which can be quickly converted into cash without any loss in value available to meet short term liabilities. As it was discussed

in the literature, there are two methods of measuring liquidity of banks which are liquidity ratios (stock approach) and liquidity gap (flow approach). The liquidity gap is the difference between assets and liabilities whereas liquidity ratios are various balance sheet items ratios which identify liquidity trends .The liquidity measure provides suggestions about the level of liquidity on which the commercial banks are operating. The first approach, liquidity ratio, uses different balance sheet ratios and it is easy to compute whereas, the second approach, funding gap, is the difference between inflows and outflows which is difficult to measure because it is more data intensive and there is no standard technique to forecast inflows and outflows. Most academicliteratures prefer liquidity ratio due to a more standardized method and therefore, this study is intended to use liquidity ratios, to measure liquidity of commercial banks, due to the availability of data. For the purpose of this study, the following three types of liquidity ratios, which are most of the time used by the National Bank of Ethiopia and which were previously used by Vodova(2011, 2012, 2013), Tseganesh(2012), Rafique& Malik (2013) and Chagwiza, (2014) are adopted.

Liquid Asset to Total Asset Ratio

The liquid asset to total asset ratio gives information about the general liquidity shock absorption capacity of a bank. In general when the ratio is high, it tells us that the bank has a capacity to absorb liquidity shock and that the bank is in a better position to meet its withdrawals. While, the higherthis ratio may indicate inefficiency since liquid assets, most of the time non-earning assets, yield lower income. As a result maintaining optimum level of liquidity is required to optimize the trade- off between liquidity and profitability by investing excess liquid asset to generate higher return.

$$L= \frac{\text{Liquid Asset}}{\text{Total Asset}}$$

3.7.2 Independent Variables

This section describes the independent variables that are used in the econometric model to estimate the dependent variable that is liquidity of commercial banks.

Size of the Bank (SIZE)

There is consensus in academic literature that economies of scale and synergies arise up to a certain level of size. Beyond that level, financial organizations become too complex to manage and diseconomies of scale arise. There are two opposing arguments both theoretically as well as empirically regarding to the relationship between bank liquidity and size. The first view is too big to fail which considers negative relationship between size and liquidity whereas; the traditional transformation view suggests positive relationship Iannotta et al. (2007). Hence, the expected sign of the coefficient of bank size is unpredictable based on academic literature. This study uses the logarithm of total asset as a proxy to measure the bank size similar to Athanasoglou et al. (2008) and Sastrosuwito& Suzuki (2011).

H1: Bank size has positive and significant effect on bank's liquidity

Capital Adequacy of Banks (CAP)

Capital is the amount of own fund available to support the bank's business and act as a buffer in case of adverse situation Athanasoglou et al. (2005). Capital of a bank includes paid up capital, undistributed profit (retained earnings), legal reserve or other reserves and surplus fund which are kept aside for contingencies. Regulators in most countries define and monitor CAP to protect depositors, thereby maintaining confidence in the bankingsystem. Though capital adequacy ratio is measured by the ratio of total capital to risk weight asset, in some literatures it can be also measured by the ratio of capital to total asset and then in this study, the proxy for capital adequacy is the ratio of total capital of the bank to total asset of the bank.

The fact that higher capital requirement provides higher liquidity to financial institutions. Evidence found include from Diamond &Rajan,(2000, 2001) where research on "Financial Fragility Structure" stating that depositors will be charged a nominal fee for the intermediary service of loaning out their respective deposits. However, this fee differs according to the borrowers' capability of repayment. For those with higher risk borrowing but are reluctant to incur higher cost, will provoke depositors to withdraw their funds. In extreme scenarios, the possibility of bank runs. Bank runs will definitely cause liquidity problems to banks. It is also found in Gorton and Winston (2000) proposing the "Crowding Out Effect" indeed meaning for preference of banks to shift investors' funds to capital accounts in purpose to meet higher capital requirements. Yet investments in capital accounts are prone to financial volatility and cyclical ups and downs. Also in facts, capital investments are not insured and cannot be withdrawn as desired. This indeed lowers liquidity creation. Similarly, Heuvel (2007) argued that higher capital

requirements hinder the amount of asset a bank can hold issuing deposits. Hence, higher capital requirement regulations can be exorbitantly costly to banks.

This ratio measures how much of bank's asset are funded with owner's funds and is a proxy for the capital adequacy of a bank by estimating the ability to absorb losses. As it is discussed in the literature review part, there are two opposing theoretical views regarding to the relationship between banks liquidity and capital adequacy. Some previous studies such as the "financial fragility-crowding out" theories predicts that higher capital reduces liquidity creation (Diamond and Rajan (2000, 2001) and hence, there is negative relationship between capital adequacy and bank liquidity whereas, Al-Khouri (2012) found that, bank capital increases bank liquidity through its ability to absorb risk and thus the higher is the bank's capital ratio, the higher is its liquidity creation. This study considered there is a positive relationship between capital adequacy & liquidity and draws the following hypothesis.

H2: Capital adequacy has positive and significant effect on bank's liquidity

Deposit Growth

Deposit mobilization is defined by Elser et al (1999) as the process of encouraging customers to deposit cash with the bank or attracting new clients to come and open accounts with the bank. From an institutional perspective, the primary motive for mobilizing savings lies in lower cost of capital compared to other sources of funds. According to Kutanet al (2010) banks serve as intermediaries accepting commercial and individual deposits (savings) and transferring them in the form of loans to investments. Different arguments and theories have been put forward to explain the different facts about bank deposit. Past studies that were conducted on the related area of factors determining commercial banks deposit growth and the variables that affect bank deposit.

Moussa (2015) found an insignificant effect of deposits on bank liquidity. Bonner et al. (2013) and Kashyap et al.(2002) argued that as demand deposits increase, liquidity asset holdings also increase. Alger and Alger (1999) provided empirical insights into liquid assets held by Mexican banks. This study summarized 10 predictions based on various theories and applied panel data estimates from January 1997 to March 1999.They assumed that at a given level of deposits, if there is more risk for borrowers as in the case of economic recession, liquid assets should also be increased by banks.

H3: Deposit Growth has positive and significant effect on bank's liquidity.

Non-performing Loans (NPL)

Non-performing loans means loans & advances whose credit quality has deteriorated such that full collection of principal and/or interest in accordance with the contractual repayment term of the loan or advance is in question (NBE directive No SBB/43/2008). The rise of non-performing loan portfolios in banks significantly contributed to financial distress in the banking sector. Non-performing loans are the main contributor to liquidity risk, which exposes banks to insufficient funds for operations. As loans & advances are the major portion of bank's asset, when they become non-performing, it will affect both profitability and liquidity of the bank. For the purpose of this study, the proxy for non-performing loans is the share of non-performing loans on total volume of loans & advances. According to Dolan and Collender (2001), credit risk is measured by the percentage of non-performing loans to total loans. Therefore, it is expected that there is negative relationship between bank liquidity and the amount of non-performing loans, the hypothesis is stated as follows.

H4: The share of non-performing loans in the total volume of loans & advances has negative and significant effect on bank's liquidity.

Market concentration

Market concentration could measures the degree of competition each bank faces in the market. This indicator is measured by the concentration index in asset terms. Herfindahl-Hirschman index (HHI) is calculated by the sum of squares of total asset shares of all banks in the market. A higher concentration level means more power for the banks, which will result in higher interest margins. The literature suggests two opposite hypotheses related to the effect of concentration on banks price behavior. The first hypothesis is the one so called structure-performance-hypothesis (SPH) which argues that a more concentrated banking sector will behave oligopolistic ally and a higher concentration will cause higher interest margin for the banks. The second one, the efficient-structure-hypothesis (ESH) confirms that concentration produces efficiency gains (because of cost reductions) causing interest margins decrease. Another reason may be that big banks have a different structure of earning assets or paying liabilities compared to smaller banks, which may affect the interest received or paid and consequently the interest margins.

HHI is a more formal and commonly used measure of market concentration that measures the size of a bank in relation to the industry and serves as indicator of the degree of competition among banks. It is calculated by squaring the market share of each bank and then summing up the resulting numbers, which

is mathematically presented as follows:

$$HHI = \sum_{i=1}^{N} S_i^2$$

Where S_i represents market share of firm in terms of total asset in the market and N refer to the number of competing firms in the market (only sample banks). And finally the researcher has expect positive and significant impact on bank's liquidity.

H6: Market concentration has positive and significant impact on banks liquidity

National Bank Bill

National Bank a government regulation which forced private banks exclusively to make investment on bonds that amounts 27% of the total loans provided by the banks to customers is currently affecting the Ethiopian private banks liquidity since huge amount of loan able funds tied up in this bond, which is measured as log of investment in NBE-Bills.It measures the exposure level to government bill which will be Negative and proxy by log of total NBE bill. The researcher expects NBE bill have a negative effect on liquidity, while it tied up loanable fund.

H7: NBEB has negative and significant effect on bank liquidity.

In general, the study considered the above six independent variables as a determinant for banks liquidity of Ethiopian private commercial banks.

3.8 Operational Definition

Table: 3.1. Operational definition and their expected relationship of variables

Variables	Symbol	Operational Definition	Source	Expected sign
Dependent				
Liquidity	LIQ	The ratio of liquid asset to total Asset	Annual report	NA
Independent				
Capital Adequacy	CAP	Share of equity on total asset	Annual report	+
Size of the bank	SIZE	Natural logarithms of total asset	Annual report	+
Deposit growth	DG	Bank deposit growth :demand, saving and term deposit vs total asset	Annual report	+
Non-performing loans	NPLs	Non-performing loans/gross loans ratio	Annual report	-
Market concentration	MC	The sum of squares of total asset shares of all banks in the market	Annual report	+
National Bank Bill	NBEB	27% of loan and advance to customer	NBEB	-

3.1 Method of Data Analysis and Interpretation

After the data were collected, it was organized and financial ratios were computed for each bank of each bank specific variables. And then, the next step was analyzing and interpreting them accordingly to achieve the stated objectives. In this study two type of statistical analysis was used to test the proposed hypotheses. These are descriptive statistics and inferential statistics/multiple regression analysis to see the effect (relationship) of explanatory or independent variables on the dependent variable. The descriptive statistics of both dependent and independent variables were calculated over the sampled periods. This helps to convert the raw data in to a more meaning full form which enables the researcher to understand the ideas clearly. And then interpret with statistical description including standard deviation, mean, and minimum & maximum. Then, correlation analyses between dependent and independent variables were made and finally a multiple linear regression and t-test analysis was used to determine the relative importance of each independent variable in influencing liquidity of Ethiopian private commercial banks. To conduct this, the researcher uses statistical tools E-views 7software. The researcher has also performed diagnostic tests to ensure whether the assumptions of the classical linear regression model (CLRM) are violated or not.

3.9. ModelSpecification

As it was discussed in the research design section of this study, the nature of data used is a balanced panel data which was deemed to have advantages over simple cross sectional and time series data. Panel data involves the pooling of observations on the cross sectional over several time periods Brooks(2008). The panel data or longitudinal data comprises of both cross-sectional elements and time-series elements; the cross-sectional element is reflected by the sample of Ethiopian private commercial banks and the time-series element is reflected in the period of study (2000-2015). This study, considered whether the use of the particular variable makes economic sense in Ethiopian private commercial banks context. The regression model used for this study was adopted from Vodova(2011, 2012, 2013), Tseganesh(2012), Rafique& Malik (2013). Thus, the following equation indicated the general model for thisstudy.

$$Lit = \alpha + \beta Xit + \delta i + \varepsilon it$$

where L_{it} is uidity ratios for bank i in time t, $Xit$is a vector of explanatory variables for bank i in

time *t*, α is constant, β are coefficient which represents the slope of variables, δidenotes fixed effects in bank *i*and $\varepsilon it$is the error term. The subscript *i* denote the cross-section and *t* representing the time-series dimension.Therefore the general models which incorporate all of the variables to test the determinants of bank's liquidity were:

$$L1it = \alpha + \beta 1\ (CAPit) + \beta 2\ (SIZEit) + \beta 3\ (DGit) + \beta 4\ (NPLit) + \beta 5\ (MCOit) + \beta 6\ (NBEBit) + \delta i + \varepsilon it$$

CHAPTER FOUR

4.1Data Analysis and Interpretation

This chapter deals with analysis of the finding and discussion of the result in order to achieve research objectives and set a base for conclusion. The chapter included five sections. The first section presented descriptive analysis of the dependent and independent variables using tables to provide an insight on the distribution of the data by bank and across time. The second section presented the correlation analysis result of dependent and independent variables. Section three presented the classical linear regression model assumptions diagnostic test results. The fourth section presented the results of the regression analysis and finally discussion of the regression results were presented under section five.

4.2Descriptive Analysis and Results

This section the summary of data used in the regression to provide statistical descriptive analysis of the dependent and independent variables. The descriptive analysis is important in providing an understanding about the distribution of the data by bank and through time as well as their be around.

The descriptive statistics for the dependent and independent variables are presented below. The dependent variables are liquidity measured by liquid assets to total assets ratio. The independent variables are: Bank size, Capital adequacy, Deposit growth, Non-performing loan, Market concentration and National Bank Bill.

4.2.1 Descriptive Analysis of Dependent Variables

Bank liquidity is liquid asset-to-total asset ratio which gives information about the long-term liquidity shock absorption capacity of a bank. As a general rule, the higher the share of liquid assets in total assets, the higher the capacity to absorb liquidity shock, given that market liquidity is the same for all banks in the sample. This measure of liquidity was taken as benchmark measure.

As shown in table 4.1, the mean value of liquid assets represent 25.34% of total assets which was above the NBE directive No. SBB/57/2014 minimum regulatory liquidity requirement of 15%. The standard deviations of 8.95% showed that, there was moderate dispersion of liquid assets to total asset ratio from its mean value for the commercial banks in Ethiopia.

The minimum and maximum values of liquidity were7.6 % and 49%respectively. The minimum value of the private bank liquidity indicates that rational amount of volatile liabilities/deposits were tied up with illiquid loans and the maximum value indicates that there were some commercial banks in Ethiopia having extra liquidity and others were going to face liquidity shortages/risk.

Table 4.1 Descriptive statistics

	LIQ	BS	CAR	DIG	MCO	NBEB	NPL
Mean	0.253	8.10	0.133	0.327	0.190	2.4029	0.081
Median	0.250	8.26	0.121	0.277	0.185	0.0000	0.060
Maximum	0.494	9.72	0.294	1.667	0.216	8.6677	0.197
Minimum	0.076	6.04	0.064	-0.034	0.181	0.0000	0.025
Std. Dev.	0.090	1.19	0.044	0.250	0.010	3.5981	0.040
Skewness	0.379	0.651	1.514	2.873	1.270	0.8357	0.063
Kurtosis	2.944	80.194	6.039	13.961	3.591	1.7342	1.873
Jarque-Bera	2.305	10.624	73.595	612.650	27.194	17.582	5.148
Probability	0.316	0.005	0.000	0.000	0.000	0.000152	0.076
Sum	24.326	129.67	12.763	31.346	18.205	230.68	52.224
Sum Sq. Dev.	0.761	29.621	0.180	5.950	0.010	1229.922	0.921
Observations	90	90	90	90	90	90	90

4.2.2 Descriptive Analysis of Independent Variables

The independent variables used in this study includes: Bank size, Capital adequacy, Deposit growth, Market concentration, non-performing loans and National Bank Bill discussed. The descriptive analyses of each independent variable are discussed here below.

Capital Adequacy Ratio (CAP)

The Capital adequacy also measured by total equity divided by total assets presents a minimum of 6% and maximum of 29.43 % with a mean value and standard deviation of 13.3 % and 4% respectively. This indicates that CAR for the sample commercial banks in Ethiopia during the study period was above the minimum requirement, which is 8%. The standard deviation for CAP was 8% revealing the level of dispersion towards the mean among banks in Ethiopia.

Capital adequacy refers to the sufficiency of funds available to absorb losses to protect depositors,

creditors, etc. in the interest of maintaining financial system stability. The higher this ratio entails the capability of the bank to absorb losses from its own capital.

National Bank Bill

With reference to table 4. 1 the mean value of NBE bill purchased by private commercial banks was 2.4029. The total bill purchased by private commercial banks range from 0 to 8.668 with standard deviation of 3.5981. The reason being minimum value zero was that private commercial banks before exposed to the requirement. On the other hand, the maximum value showed 8.668 that one of the private banks is purchased higher amount of NBE bill within five years after the requirement.

Bank Size (SIZE)

Bank size is what the bank possesses and it is useful to measure the bank's general capability to undertake its intermediary function. In this study, the proxy used to measure bank size was the natural logarithm of the total asset. As it is shown in figure 4.1 below, the average total assets of Ethiopian private commercial banks have shown consistent growth throughout the studied period. The standard deviation of 1.19 reveals that there was high dispersion of the average total asset of the banks with regard to its mean value. The mean value of bank size for the studied period was 8.10. The minimum value was recorded in the year 2000 which was the starting period of the study and the maximum value was recorded in the year 2015 which was the ending period of the study since private commercial banks shows consistent growth throughout the studied period.

Deposit Growth

As shown in the table 4.1 above, the mean value of bank deposit growth wasaround 32.65 percent for sampled commercial banks in Ethiopia. It can be noticed that the bank deposit growth fluctuates between 3% and 1.66 % percent. This means, commercial banks were achieved 32.65percent average deposit growth achieved from depositors for the period of 2000-2015. Theoretically, a growth rate of 32.65% in deposits may be considered sufficient to increase supply ofloanablefunds(Sylvester,2011).Thestandarddeviationamongbanksintermsofbankdeposit growth was 25 percent; this confirms that there were lower variations of deposit growth among commercialbanksduringthestudyperiod.Thoughtheperformanceofdepositamongcommercial banks conform to supply the loanable fund, the trend of deposit is increasing year to year at increasing rate. The reason of this increasing deposit growth may attribute to increasethe users of banking services and or intermediation of commercial banks in thecountry.

Non-performance loan

As it is defined by NBE, non-performing loan means loans & advances whose credit quality has deteriorated such that full collection of principal and/or interest in accordance with the contractual repayment term of the loan or advance is in question.

Table 4.1 shows that, the average NPL ratio of the studied banks was 8% this indicates that private commercial banks during the last sixteen years incurred 8% nonperformance loan on averages from its total loan. According to Ethiopian context, the banking sectors are required to maintain the ratio of NPLs at least below 5% NBE, (2008). However, as indicatedin table, the average NPLs of commercial banks in Ethiopia are more than the required threshold. Thus, NPLs problem are still serious for commercial banks in Ethiopia that envisaged by the maximum value of 19% indicates the presence of credit risk in some of the banks.

Market Concentration

Market concentration in total asset terms ranges from 18% to 21% with a mean of 19 % and a standard deviation value was 1%. The standard deviation result showed that there is low dispersion with the mean also the maximum and minimum value was very concentrated among each other.

This implies that total asset shares of all banks in competitive level and the degree of competitionamong private banks in Ethiopia for the last sixteen year very high and exploit the higher level of market concentration. Furthermore, this infer also a few banks dominate market share in respect of total asset. The leading private commercial banks in the studied period exploit the higher level of market concentration; implying more market power by few larger banks and fewer competitions and hence is likely to be associated with higher liquidity. The few banks that possess market power are likely to collude and raise margin in order to earn higher returns (Afzal & Mirza, 2011).What can be seen for the Ethiopian banking sector is that the relative-market power hypothesis is confirmed.

4.3 Correlation analysis among variables

In this section, the correlation between the dependent variables and the independent variables have been presented and analyzed. According to Brooks (2008), correlation between two variables measures the degree of linear association between them. To find the association of the independent variables with dependent variables Pearson Product Moment of Correlation Coefficient was used in this study. Correlation coefficient between two variables ranges from +1 (that is. perfect positive relationship) to -1

that is perfect negative relationship) and a correlation coefficient of zero, indicates that there is no linear relationship between the two variables.

In this study, the Pearson correlation coefficient was used to test the presence of association between the variables. Values between 0 and 0.3 (0 and -0.3) indicate no correlation (variables not associated), 0.3 and 0.5 (-0.3 and -0.5) a weak positive (negative) linear association, Values between 0.5 and 0.7 (-0.5 and -0.7) indicate a moderate positive (negative) linear association and Values between 0.7 and 1.0 (- 0.7 and -1.0) indicate a strong positive (negative) linear association.

4.2.1: Correlation matrix of the dependent and independent variables

	LIQ	BS	CAR	DIG	MCO	NBEB	NPL
LIQ	1						
BS	-0.0654	1					
CAR	-0.0408	0.0491	1				
DIG	0.1191	0.5552	0.3867	1			
MCO	0.3244	0.2969	0.2006	0.4593	1		
NBEB	-0.3276	-0.4895	0.0916	-0.3566	-0.4996	1	
NPL	-0.0342	0.4671	-0.1190	0.1986	0.4693	-0.6170	1

Table .4.2: Correlation analysis results and discussion between the independent variables.

According to table 4.2.1 above, capital adequacy was negatively correlated with liquidity indicated by the correlation of -0.0408 this correlation showed that as the bank's capital strength increase, liquidity decreases. This was in accordance with financial fragility and crowding out of deposits hypothesis and opposite to the expectation of the study.

Nonperforming loan was negatively correlated with liquidity, with the correlation coefficient of -0.0342. This correlation revealed that as the nonperforming loan of banks increase, liquidity decreases.

Bank size had negative linear relationship with banks liquidity in Ethiopia private commercial banks having coefficient of correlation -0.0654.This was accordance with to the "too big to fail" argument, large banks would benefit from an implicit guarantee, thus decrease their cost of funding and allows them to invest in riskier assets (Iannotta et al. 2007).

Deposit growth had positive linear correlation with banks liquidity in Ethiopia private commercial banks having coefficient of correlation 0.1191. This correlation showed that as the bank's deposit increase, liquidity increase.

Market concentration had positive linear correlation with banks liquidity in Ethiopia private commercial banks having coefficient of correlation 0.3244. This correlation showed that as the Market concentration among banks increase, liquidity increase.

National Bank bill was negatively correlated with liquidity indicated by the correlation of -0.3276 this correlation showed that as the purchase of national bank bill increase, liquidity decreases.

According to table 4.2.1 describes, Bank size was positively correlated with capital adequacy, deposit growth, market concentration, and non-performing loan having correlation coefficient of 0.0491,0.5552,0.2969 and 0.4671 respectively whereas it was negatively correlated with national bank bill , having correlation coefficient of -0.4895respectively.

Capital adequacy was positively correlated with, deposit growth ,market concentration, and national bank bill having correlation coefficient of 0.3867,0.2006 and 0.0916 respectively whereas it was negatively correlated with non-performing loan , having correlation coefficient of -0.1190 respectively.

Deposit growth was positively correlated with market concentration and non-performing loan having correlation coefficient of 0.4593 and 0.1986 respectively whereas it was negatively correlated with national bank bill, having correlation coefficient of -0.3566 respectively.

Market concentration was positively correlated with non-performing loan having correlation coefficient of 0.4693 whereas it was negatively correlated with national bank bill, having correlation coefficient of -0.4996 respectively. National bank of Ethiopia bill was negatively correlated with non-performing loan having correlation coefficient of -0.6170.

4.4 Testing the Classical Linear Regression Model (CLRM)

In this section, the researcher carried out relevant diagnostic testing to identify for any violation of the underlining assumption of the classical linear regression model (CLRM). Five assumptions were made which ensures that the estimation technique, ordinary least squares (OLS), to have a number of desirable properties, and that hypothesis tests regarding the coefficient estimates could validly be conducted. Specifically, it was assumed that average values of the error-term is zero, the variance of the errors are constant (homoscedastic), the covariance between the error-terms are zero (no autocorrelation), the error-terms are normally distributed (normality) and explanatory variables are not correlated (absence of multicollinearity).

Testing for the Average value of the error-term is zero

The first CLRM assumption requires, the average value of the errors term should be zero. As per Brooks (2008), if a constant term is included in the regression equation, this assumption will never be violated. Therefore, since the constant term was included in the regression equation, this assumption is expected to be not violated.

Testing of Heteroscedasticity Test

The second assumption of CLRM is that, the variance of the error-term is constant; this is known as the assumption of homoscedasticity. If the errors do not have a constant variance or if the residual of the regression have systematically changing variability over the sample, they are said to be heteroscedastic means the estimated parameter will not be BLUE because of the inefficient parameter. To test the homoscedasticity assumption the White's test was applied having the null hypothesis of heteroscedasticity. Both F-statistics and Chi-square ($\chi 2$) tests statistics were applied to decide whether to reject the null hypothesis by comparing p-value with significant level. The following table shows E-views results for heteroscedasticity of the dependent variables.

Table .4.3.1: Heteroskedasticity Test: white test results

	Liquidity
F-statistic	0.882593
Prob. F(27,68)	0.6316
Obs*R-squared	24.91212
Prob. Chi-Square(27)	0.5794
Scaled explained SS	21.91348
Prob. Chi-Square(44)	0.7418

Source: Computed from E-View results

It has been assumed thus far that the variance of the errors is constant. This is known as the assumption of homoscedasticity. If the errors do not have a constant variance, they aresaid to be heteroscedastic. To test this assumption the white test was used having the null hypothesis of heteroscedasticity. Both F-statistic and chi-square $(\chi)^2$ tests statistic wereused.

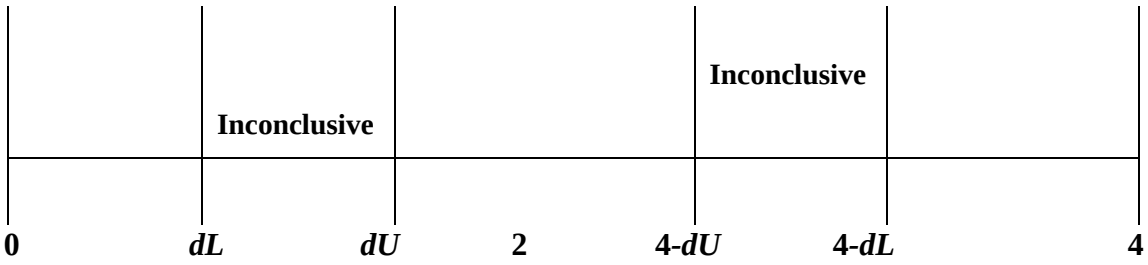
In the both the *F*- and χ^2 -test statistic give the same conclusion that there is evidence for the absence of heteroscedasticity. Since the *p*-values in all of the cases were above 0.05, the null hypothesis of heteroscedasticity should be rejected. The null hypothesis of heteroscedasticity should be rejected at 63% level for the F-statistics and at 57% level for the $\chi^{2\ test}$ statistic. The third version of the test statistic, „Scaled explained SS", which as the name suggests is based on a normalized version of the explained sum of squares from the auxiliary regression, also give the same conclusion. Generally, in all of the regression models used in this study it was proved that the variance of the error term is constant or homoscedastic and we had sufficient evidence to reject the null hypothesis of heteroscedasticity.

Auto Correlation Test

The first step in testing whether the error series from an estimated model are auto correlated would be to plot the residuals and looking for any patterns. However, graphical methods are difficult to interpret in practice and hence a formal statistical test should also be applied. The simplest test is due to Durbin and Watson (1951). Durbin-Watson (DW) is a test for first order autocorrelation - that is. It tests only for a relationship between an error and its immediately previous value (ut = ρut−1 + VT). DW is approximately equal to 2(1-p), where p is the estimated correlation coefficient

between the error term and its first order lag (Brooks 2008).According to Brooks (2008), the DW test does not follow a standard statistical distribution such as a t, F, or $\chi 2$. DW has 2 critical values: an upper critical value (dU) and a lower critical value (dL), and there is also an intermediate region where the null hypothesis of no autocorrelation can neither be rejected nor not rejected. The rejection, non-rejection, and inconclusive regions are shown on thenumber line in figure 3.1 belowFigure 4.3.1: Rejection and non-rejection regions for DW test

Reject H0: Positive Autocorrelation | **Do not reject H0: No evidence of of Autocorrelation** | **Reject H0: Negative Auto-correlation**



The null hypothesis is rejected and the existence of positive autocorrelation presumed if DW is less than the lower critical value (dL); the null hypothesis is rejected and the existence of negative autocorrelation presumed if DW is greater than 4 minus the lower critical value (4-dL); the null hypothesis is not rejected and no significant residual autocorrelation is presumed if DW is between the upper critical value (dU) and 4 minus the upper critical limits (4-dU) Brooks (2008).

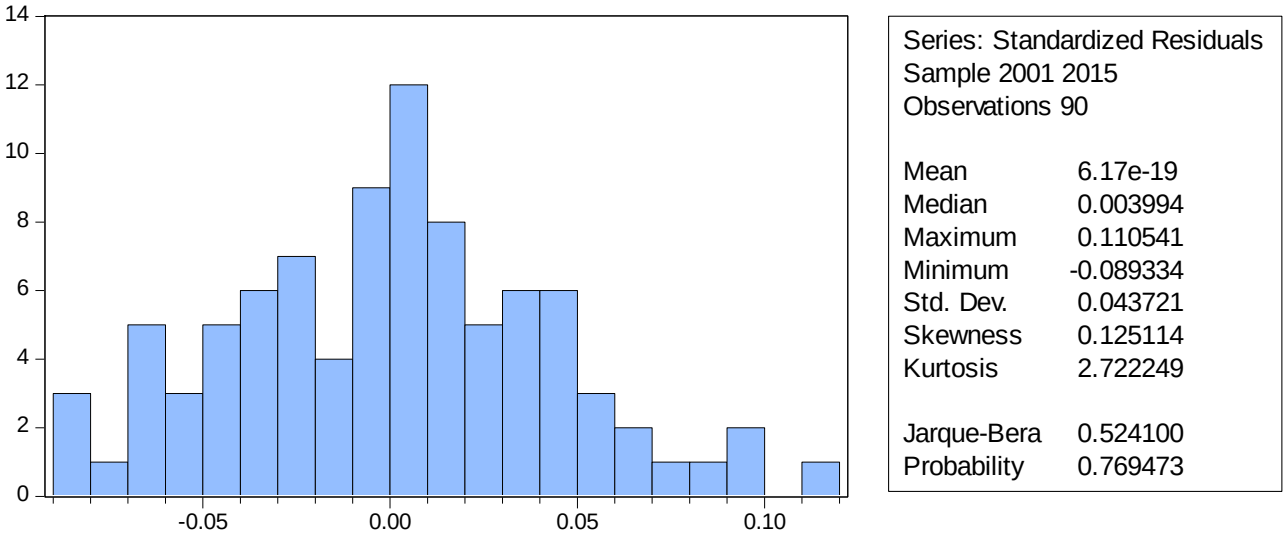
This study have seven explanatory variables (k) with ninety observations and as per the DW table in Appendix-IV for 90 observations with seven explanatory variables at 1% level of significance, the dL and dU values are 1.518 and 1.801 respectively. Accordingly, the value of 4-dU and 4-dL are 1.9981. This test revels that, the DW test has not sure to say there is no our of correlation problem because the DW test table has own limitation and the researcher has no option to test the out correlation in other way.

Test for Normality

The fourth important diagnostic test conducted in this paper is the normality assumption. According to Brooks (2008), one of the most commonly applied test for normality is the Bera-Jarque (BJ) test. The entire distribution is characterized by the mean, variance, skewness and kurtosis. Skewness measures the extent to which a distribution is not symmetric to its mean value and kurtosis measures how fat the tails of the distribution are Brooks, (2008). Thus a normal distribution is not skewed and is defined to have a coefficient of kurtosis of three and a coefficient of excess kurtosis of zero. If the residuals are normally distributed, the histogram should be bell-shaped and BJ statistic would not be significant. The p-value of the normality test should be bigger than 0.05 to not reject the null of normality at 5% level.

In this study, we used BJ normality test to test the null hypothesis of normally distributed assumption. As shown in fig 4.1 kurtosis approaches to which was 2.647. On the other hand the p- value for the BJ test was 0.7914. This implying that the data were consistent with a normal distribution assumption; since the P- value is in excess of 0.05 Thus the result of the test implies that the data were consistent with a normal distribution assumption.

Fig 4.1 Histogram



Test for Multicollinearity

The test for multicollinearity helps to identify the correlation between explanatory variables and to avoid double effects of the independent variables. It describes the relationship between explanatory variables. When the explanatory variables are highly correlated with each other, there exists multicollinearity problem Brooks, (2008).Correlation matrix between independent variables is presented in table 4.3.2. The result of correlation matrix indicates that there were low data correlations among the independent variables. These low correlation coefficients indicate that, there is no problem of multicollinearity in this study. Besides, Kennedy (2008) stated that multicollinearity problem exists when the correlation coefficient among the variables are greater than 0.70, but in this study there is no correlation coefficient that exceeds or even near to 0.70. Consequently, in this study there is no problem of multicollinearity which enhanced the reliability for regressionanalysis.

	LIQ	**BS**	**CAR**	**DIG**	**MCO**	**NBEB**	**NPL**
LIQ	1						
BS	-0.0654	1					
CAR	-0.0408	0.0491	1				
DIG	0.1191	0.5552	0.3867	1			
MCO	0.3244	0.2969	0.2006	0.4593	1		
NBEB	-0.3276	-0.4895	0.0916	-0.3566	-0.4996	1	
NPL	-0.0342	0.4671	-0.1190	0.1986	0.4693	-0.6170	1

Table 4.3.2: Correlation Matrix of Explanatory VariablesSource: E-view results of sample private commercial banks

Fixed Effect versus Random Effect Model

With panel/cross sectional time series data, the most commonly estimated models are probably fixed effect and random effects models. The researcher has used fixed effect regression instead of random effect model because of the following reasons:

i. According to Gujarati, (2004), if T (the number of time series data) is large and N (the number of cross-sectional units) is small, there is likely to be little difference in the values of the parameters estimated by fixed effect model/FEM and random effect model/REM. Hence, the choice here is based on computational convenience. On this score, FEM may be preferable since the number of time series (i.e. 16 year) is greater than the number of cross-sectional units (i.e. 6 private commercial banks).

ii. According to Brooks, (2008); Verbeek, (2004) and Wooldridge,(2004), it is often said that the REM is more appropriate when the entities in the sample can be thought of as having been randomly selected from the population, but a FEM is more plausible when the entities in the sample effectively constitute the entire population/sample frame. The sample for this study was not selected randomly rather purposively and as such FEM is more appropriate than REM.

Considering the above theoretical backgrounds in to consideration, the researcher has adopted fixed effects regression technique instead of random effect models.

4.5 Results of Regression Analysis

This section discusses the regression results of fixed effect model that determines the liquidity of private commercial banks in Ethiopia. In this study, liquidity is measured by the ratio of liquid asset to total asset.

Determinants of Bank Liquidity

The empirical model used in this study to identify the statistically significant determinants of Ethiopian private commercial banks liquidity measured by liquid asset to total asset was:

$$L1it = \alpha + \beta1\ (CAPit) + \beta2\ (SIZEit) + \beta3\ (DGit) + \beta4\ (NPLit) + + \beta6\ (=MCit) + \beta7\ (NBEBit)) + \delta i + \varepsilon it$$

……

The following table presents the regression result of the determinants of commercial bank's liquidity

measured by the ratio of liquid asset to total asset.

Dependent Variable: LIQUDITY
Method: Panel Least Squares
Date: 06/03/17 Time: 00:53
Sample (adjusted): 2001 2015
Periods included: 15
Cross-sections included: 6
Total panel (balanced) observations: 90

Variable	Coefficient	Std. Error	t-Statistic	Prob.
BS	0.004710	0.019862	0.237135	0.8132
CAR	-0.331365	0.188974	-1.753498	0.0835
DIG	-0.052352	0.048372	-1.082259	0.2825
MCO	4.227417	1.020819	4.141201	0.0001
NBEB	-0.010769	0.002065	-5.215846	0.0000
NPL	-0.500358	0.079049	-6.329756	0.0000
C	-0.254263	0.157165	-1.617804	0.1098
LIQ(-1)	0.283707	0.089056	3.185730	0.0021
	Effects Specification			
Cross-section fixed (dummy variables)				
R-squared	0.752056	Mean dependent var		0.249174
Adjusted R-squared	0.713416	S.D. dependent var		0.087803
S.E. of regression	0.047004	Akaike info criterion		-3.144278
Sum squared resid	0.170123	Schwarz criterion		-2.783195
Log likelihood	154.4925	Hannan-Quinn criter.		-2.998668
F-statistic	19.46286	Durbin-Watson stat		1.998125
Prob(F-statistic)	0.000000			

Source: Financial statement of sampled commercial banks and own computation through E-views 7

Table 4.4.1 above shows the results of the regression analysis on the determinant of the dependent variable which was measured by the ratio of liquid asset to total asset and the independent variables which includes bank specific variables for the sample of six Ethiopian private commercial banks. The coefficient of determination in this model is given by R-squared of 0.7734 and Adjusted R-squared of 0.7134, which means 71.34 % of variation of Ethiopian private commercial bank's liquidity can be explained by the variation on Bank Size, Capital adequacy, deposit growth, non-performance loan,

market concentration and National Bank Bill. The remaining 28.66 % of changes was explained by other determinants which are not included in this model. Thus, the explanatory power of the model is high. The value of F-statistics is 19.46286 with p-value of 0.000000 which is used to measure the overall significance of the model. Thus, the p-value of F-statistics is zero at six digits, the null hypothesis is rejected and the model is significant even at 1% significant level.

The above table also depicts that, Non-performance loan, market concentration and National Bank Bill had statistically significant influence on Ethiopian private commercial bank's liquidity at 1% significant level. The other variables such as Bank Size, Capital adequacy and deposit growth were statistically insignificant impact on liquidity. On the other hand the coefficient sign of Bank Size, Capital adequacy and deposit growth were contrary to our expectations whereas the coefficient sign of Non-performance loan, market concentration and National Bank Bill were in-line with our expectations.

4.5 Discussion of the Regression Results

In this section, the relationship between the dependent variable and each independent variable were discussed on the basis of the findings on this study. The dependent variable, liquidity of Ethiopian private commercial banks, were measured by liquid asset to total asset ratio. And the independent variables were, Bank Size, Capital adequacy, deposit growth, Cost of financial intermediation, loan to total asset, market concentration and National Bank Bill. Thus, the regression result of each bank specific was discussed below.

Capital Adequacy and Bank's Liquidity

H1: Capital adequacy has positive and significant impact on bank's liquidity.

In this study, capital adequacy was measured by the ratio of total capital of the bank to total asset of the bank and it was hypothesized that capital adequacy has positive and significant impact on bank's liquidity. Based on the regression result, capital adequacy was statistically insignificant and negative relation with liquidity of Ethiopian private commercial banks with the coefficient sign of - 0.3313 reveals that, there is a negative relation between liquidity of private commercial banks and capital adequacy of banks. This indicates that, when capital to total asset is increases by 1 unit, the liquidity of Ethiopian private commercial banks is decreased by 0.33 units being other variables remains constant. This negative relation of the share of capital to total asset is opposite to our hypothesis and

the coefficient sign was also in the opposite direction of our expectation.

In general, capital adequacy has no statistically significant impact on liquidity of Ethiopian private commercial banks and thus the first hypothesis; capital adequacy has positive and significant impact on bank's liquidity was rejected in our findings.

The negative and statistically insignificant impact of capital adequacy on liquidity of Ethiopian commercial banks were supported the arguments of the financial fragility-crowding out hypotheses. According to this argument, bank capital tends to impede liquidity creation through two distinct effects: the financial fragility structure and the crowding-out of deposits. The financial fragility structure is characterized by lower capital, tends to favor liquidity creation; this theory was supported by (Diamond and Rajan 2001), and hence they model a relationship bank that raises funds from investors to provide financing to an entrepreneur. The entrepreneur may withhold effort, which reduces the amount of bank financing attainable. More importantly, the bank may also withhold effort, which limits the bank's ability to raise financing. A deposit contract mitigates the bank's holdup problem because depositors can run on the bank if the bank threatens to withhold effort and therefore maximizes liquidity creation. Providers of capital cannot run on the bank, which limits their willingness to provide funds, and hence reduces liquidity creation. Thus, the higher a bank's capital ratio, the less liquidity it will create.

The second theory was concerned to a higher capital ratio may reduce liquidity creation through the crowding out of deposits. This argument was supported by Gorton and Winton (2000), and they stated that deposits are more effective liquidity hedges for investors than investments in equity capital. Thus, the finding of this study revealed that higher capital ratios shift investors‟ funds from relatively liquid deposits to relatively illiquid bank capital, which reducing the overall liquidity for investors. Therefore, the hypotheses stated; there was positive and statistically significant relationship between capital adequacy and banks liquidity was rejected.

Bank Size and Bank's Liquidity

H2: Bank size has positive and significant impact on bank's liquidity

Bank size which is measured by the natural log of total assets had a positive impact on liquidity which was in line with the assumption that small banks focus on the traditional intermediation and transformation activities and hold less liquid assets. This is to mean that small banks has little cash and cash equivalent reserves in other banks (central bank and other commercial banks) since they

have little dealing with other types of investment instruments than loans. The coefficients signs of bank size was not statistically significant even at10% significance level (p-value = 0.8132). This implies that for the study period (2000-2015) bank size of Ethiopia do not have a relationship with their liquidity. Hence, the hypothesis saying there is a significant relationship between bank size and liquidity of commercial banks is rejected or data didn't support the hypothesis.

This negative sign indicates an inverse relationship between bank size and liquidity position measured by liquid asset to total asset. Thus, it implies that for one unit change in the banks' size, keeping other thing constant had resulted 0.004710 unit adjustments on the levels of liquid asset to total asset in the portfolio in opposite direction. The result was consistence with (Vento and Ganga, 2009), Large banks would benefit from the decrease cost of funding and allows them to invest in riskier assets through implicit guarantee, Therefore, "too big to fail" status of large banks could lead to moral hazard behavior and excessive risk exposure. If big banks are seeing themselves as "too big to fail", their motivation to hold liquid assets is limited. In case of a liquidity shortage, they rely on a liquidity assistance of Lender of Last Resort. Thus, large banks are likely to perform higher levels of liquidity creation that exposes them to losses associated with having to sale illiquid assets to satisfy the liquidity demands of customers (Kotaik and Moore, 2008). Hence, there can be positive relationship between bank size and illiquidity.

This was consistent with the findings of Vodova(2011) on Hungary Commercial banks, Vodova (2013) on Poland Commercial Banks but opposite to the findings of Malik and Rafique (2013) on Pakistan commercial banks. Therefore, "too big to fail" status of large banks could lead to moral hazard behavior and excessive risk exposure. In case of a liquidity shortage, they rely on a liquidity assistance of Lender of Last Resort Vodova, (2011).

Deposit Growth

H3: has positive and significant impact on bank's liquidity.

Deposit growth has an insignificant negative impact on commercial bank deposits growth. The coefficient of this relationship of -0.052352 indicates that holding other things constant, a percentage increase in deposit growth will lead to a 28 percent reduction and vice versa in bank liquidity at a significant level of 1 percent. The present study is aligning with Devinga, (2010),deposit growth is

inverselyrelatedtoliquidityandconsequentlythehighertheloans to deposit ratio the lower the liquidity indirectly affect deposit growth and vice versa. According to Vong et al. (2009) study findings exhibits a positive relationship between loan to deposit ratio and deposit. Further Abreu and Mends (2002), found that there is a positive and significant relationship between the ratio of the liquidity and bank profits indirectly to bank deposit.

Based on the hypothesis H3, Deposit growth was as expected to have positive relationship but it has insignificant impact on liquidity of commercial banks with P value of 0.2825 finally the implication of this result shows that deposit growth rate has insignificant with liquidity of commercial banks meaning that deposit growth rate cannot influence the liquidity.

Non-performance loan

H4: Loans to total asset has negative and significant effect on bank liquidity

For non-performance loan, considering the regression model, the coefficient sign of the credit risk variable is negative in its relationship with the bank's liquidity and statistically significant at 1 percent significant level. The relationship of non-performing loans to the liquidity shows that an increase in the quantity of non-performing loans leads to a decrease of the liquidity. Ethiopian banks during this period have given more importance to loan market share increase, which is reflected in the balance sheet position. During this period, the banks have increased the variety of loan products that offer, but have shortened the processing time, deriving from the increasing competition in loan market. And also NPLs shows a downward sloping in commercial banks in Ethiopia over the time of 2002-2013 Gadise,(2014).

According to empirical results such asAngbazo, (1997; Demirgüç-Kunt& Huizinga, (1998); Abreu & Mendes, (2003) a positive correlation was expected. In some studies made in Argentina and Peru Brock & Rojas-Suarez, (2000) and Doliente,(2003) it is concluded that the sign of the coefficient is negative, which means that the margin reacts negatively to a nonperforming loans' increase. In Ethiopia case, the liquidity reacts negatively to the increase of the nonperforming loans in that period. A significant negative relationship indicates that NIM falls as the quality of loans declines (due perhaps to inadequate provisioning for loan losses or regulators reluctance to close banks in trouble, may even encourage high risk taking behavior banks with large bad loans may lower liquidity in trying to solve problems, Brock and Suarez,(2000).

The statistically significant impact of loan loss provision on liquidity is in line with hypothesis 4. In Ethiopian Commercial Banks, the ratio of total loan and advance to total assets has an estimated

coefficient of -0.500358 in the liquidity regression, which means that a unit increase in the non-performing loans brings about 1 unit decreases in the liquidity.

Market concentration and Bank's Liquidity

H5: Market concentration has positive and significant impact on bank's liquidity

For market concentration of the banking sector (measured by Hirschman Herfindahl index (HHI) for total asset), the estimated coefficient is positive and statistically significant (at 1% significant level). The result shows a positive relationship between market concentration and liquidity among the commercial banks in Ethiopia. Generally, increase in HHI indicates a decrease in market competition and increase in market power of larger firm (Ahmed &Desalegn, 2014).This indicates that the impact of concentration on liquidity depends on bank efficiency in utilizing its asset. When the market becomes more concentrated they can increase their margin by less than their inefficient competitors. What can be seen for the Ethiopian banking sector is that the relative-market power hypothesis is confirmed. This means that the banks that operate in Ethiopia exploit the higher level of market concentration; implying more market power by few larger banks and fewer competitions and hence is likely to be associated with higher liquidly.

This was in line to other empirical studies where the bank concentration index had a positive and significant effect on liquidity. For example, liquidly have been found to be positively related to the level of market concentration in European banking sector (Saunders & Schumacher, 2000 and Maudos& Guevara, 2004), and the US (Angbanzo, 1997). Highly concentrated banking industries are associated with wide spreads. The few banks that possess market power are likely to collude and raise liquidity in order to earn higher returns (Afzal & Mirza, 2011)

The statistically significant impact of market concentration on liquidity is in line with hypothesis 5. In the Ethiopian commercial banks, the market concentration peroxide by sum of square of total asset has an estimated coefficient of 0.0001 in the liquidity regression, which means that a unit increase in market concentration results in 4.2274 unit increase in liquidly.

National Bank Bill and Bank's liquidity

H6: NBEB has negative and significant effect on bank liquidity.

According to regression result investment in NBE-Bills proxied by logarithm of total NBE bill purchase is negatively related with liquidly with a coefficient estimate of -0.010769. Holding other factors constant, a 100% increase in investment in NBE Bill reduces liquidity by 10% and the p value of BILL (i.e.- 0.010769) reveals that it is statistically significant at 1% level of significance and also it was in line with the hypothesis. Therefore, there is a negative and significant relationship between NBE bill purchase and liquidly. The result implies that banks will lose a benefit if it would have invested in relatively giving loans to borrowers. This result was consistence with the study of Tesfaye (2014) and Eden in the same year. In general, NBE bill highly affect liquidly of private banks because the interest rate calculated on the bills (3%) is far less than the market lending rate and also incurred more interest paid to depositors.

Chapter Five

Conclusions and Recommendations

The preceding chapter presented the analysis of the findings, while this chapter deals with the major conclusions and recommendations based on the findings of the study. The chapter is organized in to two sub-sections, the first section presented the major conclusions of the study and the second section deals with the recommendation drawn from the study.

5.1 Summary of Major Findings.

The main objective of this study was to identify the bank specific determinants of liquidity of Ethiopian private commercial banks. To comply with the objectives of the study, six bank specific was used. The bank specific variables include; Bank size, Capital adequacy, deposit growth, non-performance loan, market concentration and National Bank bill. The study was used panel data for the sample of six private commercial banks in Ethiopia which had sixteen years of banking service over the period 2000 to 2015. The bank specific data were mainly collected from annual audited financial reports of the respective sample banks.

Data was presented and analyzed by using descriptive statistics, correlation analysis and balanced fixed effect regression analysis to identify the determinants of liquidity of Ethiopian private commercial banks which were measured by liquid asset to total asset. While before performing the regression analysis, test for CLRM assumption were conducted.

The study found that capital adequacy has negatively correlated with the bank liquidity ratio. This means that a positive relationship between capital adequacy and bank liquidity exist which in line with the risk absorption theory proposed by Diamond and Dybvig (1983) and Allen and Gale (2004) research. The reason behind the positive relationship between capital adequacy and bank liquidity is because higher capital improves the ability of banks to create liquidity.

Concerning to degree of computation measured by market concentration and this reacts positively towards the increase in computation pressure. Ethiopian banking system exploits the higher level of market concentration; which implies more market power by few lager banks and fewer competitions and hence is likely to be associated with higher liquidity.

The researchers find that the non-performing loan is negatively correlated with bank liquidity ratio. This result is supported by Joseph, Edson, Manuere, Clifford and Michael (2012), indicating that NPLs have a negative relationship towards bank liquidity. The explanation is that when a bank involves in excessive lending, the possibility of defaulting loans increases. This default deteriorates the bank liquidity.

5.2 Recommendations

This study was intended to identify the determinants of liquidity of Ethiopian private commercial banks; and hence on the basis of the findings of the study, the following recommendations were drown.

The negative relationship between bank size and liquidity revealed the “too big to fail” hypothesis, in which big banks may encourage to disburse more loans and advances. Thus, big banks needs to manage their liquidity position and shall give due attention on resource mobilization and liquidity management.

NBE requires each bank to purchase bill which is 27% of their total loan with 3% interest rate. This in turn affects banks liquidity, therefore it is better if policy makers minimize either the percentage of total loan required to purchase the bill or increase the interest rate paid for the bill.

Loans are the main assets to a bank. However, banks should also avoidconcentrating on long term loans as they are riskier and illiquid. Banksshould plan their loan portfolio to an optimal level to reduce their risk and increase their liquidity.

Moreover, government can control the competition so that smaller bankswould have more competitive edge to expand thus making them moreliquid and stable.

References

Abreu, M & Mendes, V 2001, '*Commercial bank interest margins and profitability*: evidence from some EU countries', IEFS-UK & University of Macedonia Economic & Social Sciences, Thessaloniki, Greece, May 17-20.

Abreu, M., & Mendes, V. (2002). *Commercial Bank Interest Margins and Profitability Evidence* for Some EU Countries. *CISEP No. 830*.

Acharya, V & Naqvi, H 2010, '*The seeds of a crisis: A theory of bank liquidity and risk - taking over the business cycle'*; *Journal of Financial Economics*, Vol. 106, pp. 349-366.

Acharya, V, Shin, H & Yorulmazer, T 2011, 'Crisis Resolution and Bank Liquidity, *The Review of Financial Studies*, Volume 24(6), pp. 2166-2205.

Afzal, A., & Mirza, N. (2011). *Market Discipline in Commercial Banking: Evidence from the Market for Bank Equity*. *The Lahore Journal of Economics*, pp. 233-254.

Agbada, AO. & Osuji, CC 2013, 'The efficacy of liquidity management and banking performance in Nigeria', *International Review of Management and Business Research*, volume 2(1), pp. 223 – 233.

Ahmed, Z., & Desalegn, G. (2014). Structure Competation of Banking Industry in Ethiopia. *Birritu*, 26.

Alger, G, Agenor, PR and Alger, I 1999, Liquid Assets in Banking: Theory and Practice, Boston College, Chestnut Hill, MA Working Paper, No. 446

Al-Khouri, R. (2012): Bank characteristics and liquidity transformation: The case of GCC banks. *International Journal of Economics and Finance Vol. 4, No.*12, pp. 114-120.

Allen, F and Gale, D. (2003): Financial Intermediaries and Markets: *Journal of Econometric*, Vol. 72, pp. 1023-1061

Angabazo, L. (1997): Commercial bank net interest margins, default risk, interest-rate risk, and off-balance sheet banking", *Journal of Banking and Finance*, Vol. 21, pp. 55-87.

Aspachs, O, Nier, E and Tiesset, M. (2005): Liquidity, Banking Regulation and the Macro economy: *Evidence on bank liquidity holdings from a panel of UK-resident banks", Bank of England Working Paper*

Athanasoglou, P, Brissimis, S. and Delis, M. (2005): Bank specific, industry specific and macroeconomic determinants of bank liquidity; *Journal of International Financial Markets*, Vol. 18, No.2, pp.121-136

Baltensperger, Ernst (1980): Alternative Approaches to the Theory of the Banking Firm: *Journal of Monetary Economics, Vol. 6, pp.1–37*

Bank for International Settlement (2004): International Convergence of Capital Measurement and Capital Standards: *Basel Committee on Banking Supervision*.

Bank for International Settlement (2008): Principles for Sound Liquidity Risk Management and Supervision: *Basel Committee on Banking Supervision*.

Bank for International Settlement (2010): A global regulatory framework for more resilient banks and banking system. *Basel Committee on Banking Supervision*

Bank for International Settlement (2011): Capital Adequacy and Liquidity after the Financial Crisis: *International Finance Seminar 2010/2011*

Bank for International Settlement (2013): Liquidity Regulation and the Implementation of Monetary Policy: *Working papers No 432*

Bank for International Settlement (2013): The Liquidity Coverage Ratio and Liquidity Risk Monitoring Tools: *Basel Committee on Banking Supervision*

Berger, A, Bouwman, C, 2009b, 'Financial Crises and Bank Liquidity Creation', Working Paper, pp. 08-37, Wharton Financial Institutions Center.

Berhanu.B. (2015): Determinants of Banks liquidity and their impact on financial performance: *Empirical study on Commercial Banks in Ethiopia*. *MSC Thesis, AAU*

Bhattacherjee .A.(2012): Social Science Research: Principles, Methods and Practices, 2nd edition. *University of South Florida*

Bloem, MA and Gorter N.C. (2001): Treatment of Non-Performing Loans in Macroeconomic Statistics*", International Monetary Fund, Working Paper 2001-209*

Bourke, P.(1989): Concentration and other determinants of bank profitability in Europe, North America and Australia; *Journal of banking and Finance*, No, 13, pp.65-79

Bonner, C, Vtyurina, R and Lely, IV 2012, Determinants of Banks Liquidity Buffers in Central America; working Paper, available at: http://www.managementparadise.com/

Brock. P and Suarez, R. (2000): Understanding the behavior of bank spreads in Latin America, *Journal of Development Economics*, Vol. 63, pp.113–134

Brooks. C. (2008): Introductory Econometrics for Finance, 2nd edition. *CAMBRIDGE University*

press

Brunnermeier .M.K. (2009): Deciphering the Liquidity and Credit Crunch 2007-2008: *Journal of economic perspectives .Vol. 23 No. 1 pp. 77-100*

Bryant, J (1980): A model of reserves, bank runs, and deposit insurance", *Journal of Banking and Finance,* Vol. 4, pp. 335-344

Calomiris, C and Kahn, C 1991, 'The role of demandable debt in structuring optimal bank arrangements', *American Economic Review,* Vol. 81, No. 3 pp. 497-513.

Chagwiza.W.(2014): Zimbabwean Commercial Banks Liquidity and its Determinants*: International Journal of Empirical Finance, Vol. 2, No. 2, PP. 52-64*

Crosse, H and Hempel, G (1980): Management Policies for Commercial Banks, 3rd ed., *Prentice Hall Inc., Englewood Cliffs, New Jersey*

Crowe, K. (2009), "Liquidity risk management –more important than ever", Harland Financial Solutions, P.3

Dermigurc-Kunt, A., & Huizinga, H. (1998). Determinants of Commercial Bank Margin and Profitability: Some International Evidence. *World Bank policy Research working papers*, wps1900.

Dolan, JA &Collender, RN 2001, Agricultural banks and the federal home loan bank system,Retrieved from http://afr.dyson.cornell.edu/61/Pdfspring/V61_1SP4.pdf.

Doliente, J. (2003, August). Determinants of Bank Interest Margins of Southeast Asia. *ISI Journal*.

Drehmann.M and Nikolaou.K (2008): Funding liquidity Risk: Definition and Measurement:

CESifo Conform Center, Munich

Dinger, V. (2009). Do foreign-owned banks affect banking system liquidity risk? Journal of Comparative Economics, Vol 4: 647–657.

Diamond, D W and Dybvig, P. H. (1983): Bank runs, deposit insurance, and liquidity. *Journal of Political Economy*, Vol. 105, No. 91, pp. 401-419.

Diamond. D.W. (1984): Financial Intermediation and Delegated Monitoring: *The review of economic studies; Vol 51.No3. pp 393-414*

Diamond, D.W and Rajan, RJ (1998): Liquidity Risk, Liquidity Creation and Financial Fragility: A Theory of Banking, *NBER Working Paper Series, Cambridge, No. 7430, pp. 3-40*

Diamond, D. W. and Rajan, R G (2000): Theory of bank capital: *Journal of Finance*, Vol. 100, No. 55, pp. 2431-2465.

Diamond. D. W and Rajan. R. G (2001): Liquidity risk, liquidity creation, and financial fragility: a theory of banking: *Journal of Political Economy*, Vol. 109, No. 2, pp.287-327.

Diamond and Rajan.(2002): Banks and Liquidity. *American Economic Review Papers and Proceedings, Vol 1:8-23*

Diamond, D. W. and Rajan, R G (2005): Liquidity shortages and banking crises", *Journal of Finance*, Vol. 60, No. 2, pp.615-647

Drehman, M and Nikolau, K (2009): Funding liquidity risk: definitions and measurement: *ECB working paper, No. 1024*

ESRB (2013): Recommendation of the European Systematic Risk Board on funding of credit institutions.

Eden, K. (2014). The Impact of National Bank Regulation on Banks Performance: Evidence from the Private Banks of Ethiopia.

Elser, L, 1999, 'Strict Dollarization and Economic Performance: An Empirical Investigation', *Journal of Money, Credit & Banking*, Eschborn, Washington DC.

Fadare, O.S. (2011): Banking Crisis and Financial Stability in Nigeria", *International Research Journal of Finance and Economics*, Vol. 63 pp. 1450-2887

Ghafoor A. (2009): Comparison of Islamic and conventional banking in Pakistan", *Department of Economics, Islamia University, Bahawalpur-Pakistan*, Vol. 23, No. 2, PP. 1-36

Gonzalez-Eiras, Martín, (2003): "Banks" Liquidity Demand in the Presence of a Lender of Last Resort," *Documento de Trabajo 61 (Buenos Aires: Universidad de San Andrés).*

Gorton, G and Winton, A. (2000): Liquidity provision, bank capital, and the macro-economy: *University of Minnesota, Working Paper*

Gujarat, DN. (2004): Basic Econometric, 4th edn., *McGraw–Hill, USA.*

Hempel, G.H, Simonson, D.G and Coleman, A.B (1994): Bank Management, 4th ed., John Wiley & Sons: New York.

Heuvel, S. J. (2007, August). *The welfare cost of bank capital requirements.* Retrieved from http://fic.wharton.upenn.edu/fic/papers/07/0719.pdf

Iannotta, G, Nocera, G, and Sironi, A. (2007): Ownership Structure, Risk and Performance in the European Banking Industry: *Journal of Banking & Finance*, Vol. 31, pp. 2127-2149.

Ifeoma, C, Victor A and Emenike, O 2013, 'Impact of informality on the liquidity of deposit money banks in Nigeria', *Global Journal of Human Resource Management*, Vol.1, No. 3, pp. 12-28.

Karlee .C, Yoong . L, Murthi .L, Soon. T. and Yee. T.(2013); The Determinates Influencing Liquidity of Malaysia Commercial Bank and its implication for relevant bodies: *Evidence from 15 Malaysia Commercial Banks*: University Tunku Abdulrahman

Kashyap, A.K, Rajan, R.G and Stein, J.K (2002): Banks as liquidity providers: an explanation for the coexistence of lending and deposit taking", *Journal of Finance,* Vol. 58, No. 1, pp.33-73

Kennedy, P 2008, *A Guide to Econometric*, 6th edn., Blackwell Publishing, Malden.

Kiyotaki, N. and Moore, J. (2008): Liquidity, business cycles and monetary policy. *Princeton University, unpublished.*

Kutant, AM 2010, 'Evaluating the effects of deposit Dollarization in bank profitability' Fordham University, Dealy Hall Bronx, New York.

Laurine, Ch. (2013): Zimbabwean Commercial Banks Liquidity Risk Determinants after Dollarization, *Journal of Applied Finance & Banking*, Vol. 3, No.6, pp. 97-114

Lucchetta, M. (2007): What do data say about monetary policy, bank liquidity and bank risk taking?", *Economic notes by Banca Monte deiPaschi di Siena SPA*, Vol. 36, No. 2, pp.189- 203

Malik.F. and Rafique. A. (2013); Commercial Banks Liquidity in Pakistan: Firm Specific and Macroeconomic Factors: *The Romanian economic Journal,* Vol.16, No 48, pp 139-154

Maudos, J., & Guevara, F. (2004). Factors Explaining the Interest Margin in the Banking. *Journal of Banking and Finance, 28*(9), 2259–2281.

Moh"d, KA.L and Fakhris, S.O 2013, Determinants of capital adequacy in Jordanian commercial banks; *International journal of academic research in economics and management*, Vol.2, No.4, pp.44-58

Moussa Mohamed Aymen Ben (2015): The Determinants of bank liquidity: Case of Tunisia:

International Journal of Economics and Finance Issues. Vol. 5, No. 1, 2015, pp.249-259

Mohamed Aymen Ben Moussa (2015): The Determinants of bank liquidity: Case of Tunisia:

International Journal of Economics and Finance Issues. Vol. 5, No. 1, 2015, pp.249-259

Moore, W (2010): How do financial crises affect commercial bank liquidity?: *Evidence from Latin America and the Caribbean", MPRA Paper, No. 214*

National Bank of Ethiopia, Directives No SBB/43/2008: Asset Classification and Provisioning (4th Replacement)

National Bank of Ethiopia, Directives No SBB/50/2011: Minimum Capital Requirement for Banks in Ethiopia

National Bank of Ethiopia, Directives No MFA/NBEBILLS/002/2013: NBE Bills purchased

National Bank of Ethiopia, Directives No SBB/55/2013: Reserve Requirement (6th Replacement)

National Bank of Ethiopia, Directives No SBB/57/2014: Liquidity Requirement (5th Repayment)

National Bank of Ethiopia (2010): Bank Risk Management Guidelines

Patheja, A. (1994): Financial management of commercial banks, *South Asia Publications: Delhi*

Praet, P and Herzberg, V 2008, 'Market liquidity and banking liquidity: linkages, vulnerabilities and the role of disclosure', *Banque de France financial stability review*, pp. 95-109.

Ramakrishnan .R. and Thakor. A.V.(1984): Information Reliability and a Theory of Financial Intermediation: *The review of economic studies; Vol 51 No .3, pp 415-432*

Rauch, C, Steffen, S, Hackethal, A and Tyrell, M (2009): Savings Banks, Liquidity Creation and monetary Policy.

Repullo. R.(2003): "Liquidity, Risk-Taking and The Lender of Last Resort": *International Journal of Central Banking.*Vol.1. No 2.

Rochet, J.C. (2008): Liquidity regulation and the lender of last resort: Financial Stability review, Special issue on liquidity No.11 PP 45-52"

Rychtárik, S (2009): Liquidity Scenario Analysis in the Luxembourg Banking Sector", *Working Paper BCDL 41*

Santomero, Anthony M., (1984): Modeling the Banking Firm: *Journal of Money, Credit, and Banking, Part 2*, Vol. 16, pp. 576–602.

Saunders .M, Lewis.P and Thornhill .A.(2009): Research methods for business students, 5th edition. *FT Prentice Hall*

Sastrosuwito, S and Suzuki, Y 2011, '*The determinants of post-crisis Indonesia banking system* profitability', *Economics and finance review*, Vol. 1911), pp. 48-57.

Tseganesh.T. (2012): *Determinants of Banks liquidity and their impact on financial performance: Empirical study on Commercial Banks in Ethiopia*. *MSC Thesis, AAU*

Valla, N, Saes-Escorbiac, B, and Tiesset,M. (2006): Bank liquidity and financial stability", *Financial Stability Review, Banque de France, pp. 89-104*

Verbeek, JM 2004, '*A guide to modern econometrics'*, 2nd edn., John Wiley & Sons Ltd, Erasmus University Rotterdam.

Vodova.P.(2011): Determinants of Commercial Banks liquidity in the Czech Republic. *International journal of mathematical models and methods in applied science,* PP 92-97

Vodova. P. (2012): *Determinates of Commercial Banks liquidity in Slovakia . International journal of mathematical models and methods in applied science,* PP 740-747

Vodova.P.(2013): *Determinants which affect Liquid Asset Ratio of Czech and Slovak Commercial Banks*. *Journal of Financial Assets and Investing*, No 1, PP. 25 41

Vodova.P.(2013); Determinants of Commercial Banks liquidity in Hungary. *International journal of mathematical models and methods in applied science*, PP 180-188

Vodova.P.(2013); *Determinants of Commercial Banks liquidity in Poland*.: *Proceedings of 30th International Conference Mathematical Methods in Economics* PP 962-967

Worku, G 2006, *'liquidity and its impact on performance of commercial banks in Ethiopia*', MSc project paper: Addis Ababa University

Wooldridge, JM 2006, *Introductory Econometric: A Modern Approach*, International Student edition, 3 rd edn., Canada: Thomson South Western

Yeager, F.C and Seitz, N.E (1989): *Financial Institution Management*: Text and Cases, 3rd ed., Prentice Hall Inc., Englewood Cliffs, New Jersey

Zerayehu Sime, Kagnew Wolde and Teshome Ketema (2013): *Competition in Ethiopia Banking Industry*: *African journal of Economics,* Vol. 1, No 5, pp 176-190